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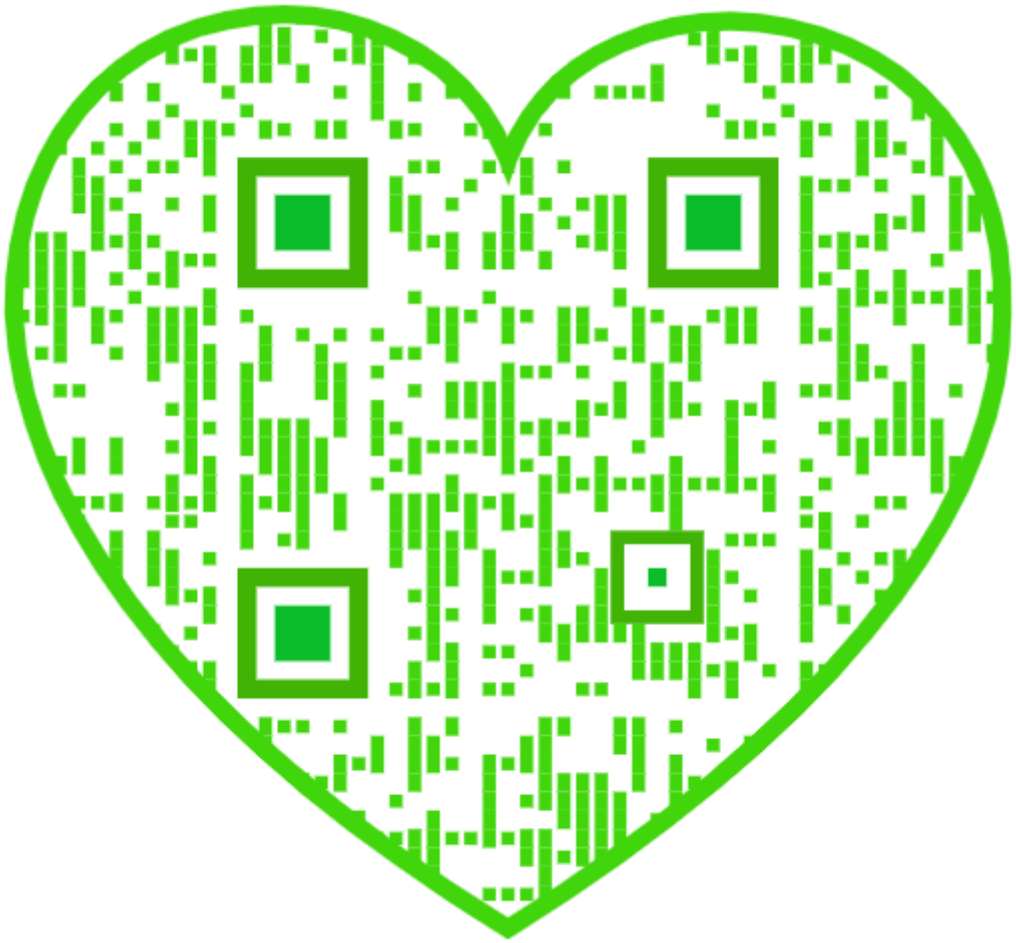

FIRST LESSON IN PAINTING BY FOURTEEN YEAR OLD PUPIL

WHO NEVER HAD INSTRUCTION IN COLOR OR USED PASTELS AND COULD DO NO BETTER THAN THE LEFT-HAND SKETCH. THE RIGHT-HAND SKETCH WAS MADE IN THE SAME LESSON WITH NO ASSISTANCE EXCEPT THAT RELATING TO THE USE OF THE PAINTING GLASS, WHICH REVEALED TRUE VALUES AND COLOR EVEN TO THE BLUISH HIGH LIGHT ON THE RED APPLE.

DRAWING AND PAINTING SELF-TAUGHT

BY

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AND THE

DRAWING AND PAINTING GLASS

WITH GRADED LESSONS BY

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MASSACHUSETTS

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WINTHROP 52, MASS.

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IN MEMORIAM.

I inscribe these pages to the memory of Professor Walter Smith, the founder of the Massachusetts Normal Art School and its director during the first two years of my studentship.

After several foreign expositions had shown that a manufacturing state must encourage art education if its industries are to succeed, the Commonwealth of Massachusetts and the City of Boston extended a joint invitation to Professor Smith to take charge of Art Education in the State and in Boston. This he did in 1871.

Professor Smith was recommended by English Art Educators as the best man for the work, and the success of the Normal Art School is due to the splendid influence and unusual ability of Professor Smith, who fought for all that was sane, honest, and true in art and art education.

This nation is greatly indebted to Professor Smith for the splendid accomplishments of those who were students under him, and the many more who profited by his influence after he had left the school in charge of those who maintained the high standards which he had established.

As Director of Art for Boston he prepared graded lessons for his teachers. These were desired for general use, and thus the "Walter Smith Drawing Books" were published. As a boy I used these books, and when a drawing was to be copied I followed the printed directions and made my copy either a little larger or a little smaller than the original.

When, a few years later, a revision of the books was desired an unfortunate controversy arose the circumstances of which have been given me by many who were familiar with them at the time, as I now relate them.

After Professor Smith had approved each page of the new edition, changes were made without his knowledge, and when the books were printed a series of dots appeared in each of the spaces formerly left blank for the drawing to be enlarged or reduced by eye. Professor Smith asked to have these dots taken out, and this being refused he said his name must not appear on the books and he could not use them in the Boston Schools. He was informed that if he did not, he would probably lose his position. In spite of what he may have regarded as an implied threat, he insisted that the books be printed without the dots or that

his name be taken off the books, although this no doubt meant the loss of a fortune in royalties. Not being able to take out the dots he refused to use the books in Boston, although this involved the hurried preparation of substitute lessons.

When Professor Smith resigned life positions in England, he was told his Massachusetts positions would be as permanent, but at a meeting of the School Committee which came shortly afterwards he was not reelected. Soon after this he lost the State positions and went back to England to take charge of the English Technical College in Bradford, Yorkshire. Four years later he died at the age of only fifty.

It seems so incredible that an expert unusually inspiring and successful as director, teacher, author and lecturer could have been unjustly treated that I wish to call attention to four Government reports upon "Art and Industry" by Colonel Isaac E. Clarke in which many pages are devoted to commendation of Walter Smith and his work in America. The following is quoted from this report. Part II, xlvii.

"In the widely scattered homes of this broad land the young men and the young women who rejoiced to sit at his feet and who caught the inspiration of his enthusiasm will long cherish his memory and mourn his loss; while those who recognized the uncommon genius of the man and who realize that he could leave no single successor who would be considered as of equal authority, can never cease to regret that his career in America should have been for any reason so prematurely and infelicitously ended."

"It is gratifying to know that although absent for thirteen years, he was so esteemed in his native country as to be eagerly welcomed on his return and at once given an honorable and lucrative position. . . . There is however little satisfaction to those who realize what Walter Smith had already effected here. . . . This English provincial college gains a great teacher but America loses an unrivalled educational leader." From Part I, p. 62.

PREFACE.

Thirty years ago I made my first efforts to cause instruction in drawing to become vision training in place of picture making in the production of which the student's hands and teacher's eyes and knowledge were combined. I have endeavored to accomplish this result by having the student substitute many quick sketches, each self-corrected for one or more long pieces of work of finished but superficial result.

In 1895 I published the book Free-hand Drawing and explained that I made use of clear window glass simply as a drawing tablet to be used in place of paper; that the drawing was made upon it entirely free-hand when a sheet of white cardboard was placed behind the glass; that all tests and the usual measurements were forbidden until the drawing became as perfect as possible by eye alone; that when complete the drawing was tested for the first time by removing the card and looking through the glass to see if the drawing would appear to cover the object. I carefully explained that the Glass was not for tracing or for correcting work on paper, and that it was soon discarded because its proper use resulted in eyes that were truer than the results of tracing or other use of the Glass as an aid to results on paper.

In spite of these assertions which have been repeated on every possible occasion since the method was published, the Glass is still supposed to be a device for tracing, first upon the Glass, and then from the Glass to paper, as explained by Leonardo da Vinci.

When my first book was written the Glass was without the spirit-level, which experience proved necessary if students were ever to see angles truly. Only in recent years has the Glass been perfected by the addition of two lenses, which enable students to discover mistakes in light and shade and color as surely as the spirit-level enables them to find mistakes in perspective outline.

New methods of using the Glass with young pupils have recently been tried, and have proven that it is possible for fourth grade children to draw from nature with class results that equal those in other subjects.

New methods of using the Glass in Art Schools for the training of the memory and for the study of free-hand perspective have been tried and perfected.

These methods enable all the students to understand with

little aid from the teacher, whereas formerly with all possible assistance, only the talented were able both to explain and practically use the essential theories.

Therefore this book is undertaken to explain these new methods as well as emphasize again the folly of tracing and the usual tests that substitute measurements for true eyes. Such methods are crutches that enable one to hobble at the start and insure the continuance of this crippled condition as long as tests and measures are depended upon more than the vision.

The methods of this book are not based on tracing or any system of measuring or testing to be used permanently. Their sole aim is to discard all measures and tests as far as possible from the start. Even pencil measurements are forbidden with the rest, until the student has done his very best by depending upon his eyes alone. Then only is the first test permitted, and it is so simple that a child can apply it perfectly and be his own teacher.

By this method the first drawings are made with a special, soft crayon upon a sheet of clear window glass, a piece of white cardboard being held behind the glass so that the drawing can be seen upon the glass as readily as it would be upon paper. The test is applied by removing this cardboard back and holding up the glass to see if the lines of the drawing will appear to cover the edges of the object studied. If they do this when the spirit-level shows that the glass is held level, then the angles and proportions of the sketch are correct. If the lines will not cover those of the object, however, these mistakes are seen, and the student thus instructs himself.

These methods do not render it easy for even the talented to become artists, but they do enable object drawing to be studied profitably by all Grammar School pupils who are able to do the other required work.

These methods will enable any one to gain in his own home the power to draw and paint truthfully from nature. When this is understood and proven, High School graduates will be expected to have this ability. In time this will mean a general appreciation of art that has never before been known. This will lead to the recognition of exceptional ability and the support of artists who have it. It will not increase the number of poor artists, for when all are able to master drawing as readily as writing or arithmetic, those of average ability will not study art as a profession. They often do this now because average power to draw is falsely considered proof of genius. One who can write only a descriptive letter has as much chance of becoming a famous poet as a student of art has of becoming a famous

artist when his only power is that of drawing truthfully from nature.

These methods will not enable the student or the teacher to avoid the hard work that must always underlie real success. Copying and dictation and most other subjects give results to exhibit more quickly than honest use of the Glass. Teachers who try to give visual power, will find that the Glass does away with the strain involved in correcting drawings, and enables the class to make many more drawings and correct them all with very little assistance.

Drawing teachers are now the most overworked of all teachers, and the failure of drawing in the elementary schools is not due to lack of effort or ability on their part. I have no word of criticism for the drawing teacher, who far too often is an artist by nature and training, and yet not free to teach as he wishes, because of influences that confine and restrict art instruction in public and elementary schools to a greater degree than other subjects.

The possibilities of this method can not be known until students who have used the Glass all through the Grammar School graduate from the High School. Such students should do work far better than any produced thus far through only a partial use of the Glass.

This book is to supplement my earlier books and not to take the place of any of them. It is not a complete Text-book for art students' use, but it aims to give a quick and sure method whereby the student may gain by self-instruction true vision for outline, values, and color.

The chapter on Perspective is not a full presentation of the subject, for the scientific method is not explained at all, and only the few problems most necessary to the artist are presented in the new way developed from the use of the Glass in the study of object drawing from memory and from observation.

The chapter on Graded Lessons does not pretend to be a complete course for the public schools, but only a practical method for teaching object drawing in the grades. Many excellent books supply all needed aid in design and other subjects that should be included in a public school course.

The purposes of this book are: First, to make it possible for any person to gain power to draw and paint from nature by home study; Second, to present a method for use in the public schools that shall make object drawing as generally possible as other studies; Third, to make an effort to harmonize the conflicting views of those teachers who consider drawing from the opposing standpoints of art and science and who thus make it

so artistic that there is no foundation of science to support free expression, or on the other hand make it so literal that there is little chance for free and artistic expression. I shall in this last effort try to show that science and art must be inseparable in the practice of the artist and should have equal attention in the schools.

I have not reproduced my students' drawings on account of their excellence but because they are the unaided efforts of beginners. When they are compared with the crude sketches made on entering the gain is apparent though defects are still evident. These mistakes were pointed out but corrections were not permitted, since this would have caused reliance on the instructor more than on self-criticism.

It is impossible fully to show the actual gain since the process will not reproduce the quick sketches that are most conclusive. Figures 4 and 5 show best the value of the method, for these prize drawings were made by students whose average age was twenty-one and who had spent about three years in the Massachusetts Normal Art School, where only a small part of the time is given to figure drawing. These prizes were competed for by students of the best art schools in the country in which it is the custom to spend six or eight years in study of the figure alone.

When the Faculty of the Art Museum School secured my appointment as instructor of still life it gave me my first opportunity to teach drawing, values, and color at the same time, for in the Normal Art School, I was restricted to outline. A few months' experience with the serious students of the Museum makes me confident that as much time can be saved in the study of painting by the use of the Painting Glass as is saved in the study of drawing by the use of the Drawing Glass. As the Painting Glass was not used by the students in the Normal Art School the only illustration that is positive proof of its influence is the Frontispiece.

This book is very different from my first ones, and it is different from what I would have written five years ago. In the next five years I may wish to change this book, but I offer it as the result of my experience up to this time, in the hope that it may aid others to make truthful nature study the foundation for art expression.

The reproductions of pencil drawings by Miss Anna M. Hathaway combine truth, beauty, and good technique in a way helpful for students to study. Miss Hathaway was first a student and has been for many years a teacher in the Normal Art School. Her drawings show what it is possible for a talented student to do as a result of the broad training recommended.

I am indebted to my sister, Miss Evelyn F. Cross, for the demonstration that has enabled grade teachers, who have never made a special study of drawing, to use the Glass with such success that the object drawing has been a pleasure to themselves and their pupils when formerly all had disliked this subject.

I am also indebted to Mr. Arthur B. Webber, Superintendent of schools at Stoneham, Mass.,—who permitted the experiments with the Glass at a time when object drawing has not been the fashion in Grammar Grades. Without this assistance the first experiments, that failed, would have been the last.

I am indebted to the Suffolk Engraving Co. for unusual interest and care in the reproduction of difficult subjects.

From photograph of the pitcher and background from which the Frontispiece was drawn. The apple was not the same, but the light and shade and color values are nearly true in this photograph, and prove how much the student gained in the first lesson.

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DRAWING AND PAINTING SELF-TAUGHT

Chapter I.

VISION TRUER THAN TESTS.

1. Ruskin said, "The excellence of an artist as such depends wholly on refinement of perception and that it is this mainly which a master or a school can teach. . . . One task, however, of some difficulty, the student will find I have not imposed upon him; namely learning the laws of perspective. For perspective is not of the slightest use, except in rudimentary work. . . . No great painters ever trouble themselves about perspective and very few of them know its laws; they draw everything by the eye, and, naturally enough, disdain in the easy part of their work rules which can not help them in difficult ones."*

2. **Artists and Educators Differ.**—Though the above statement harmonizes with the practice of the masters, past and present, it has not influenced the educators who are apt to pity the artist for his ignorance, and assure students how much better the artists would paint if they would understand theory.

The artist's influence is confined to his students. The educator's influence extends far more widely through art schools, normal schools, universities, summer schools, public schools and especially through text-books and publishing firms. Thus elementary art study is far too often based on rules, theories, tests and measures instead of on vision, and it places special emphasis on technique instead of on true representation.

3. **Trust Your Eyes.**—I was taught to trust measurements more than my eyes, and therefore I explained in my first books the best way to measure. Several years after these books were written my pupils proved to me that they could see more exactly than they could measure even when they followed my directions for measuring, and then I began to forbid the pencil measurements that prevented reliance upon more truthful eyes.

Any teacher may prove that the average pupil can see closer than he can measure by placing his measured drawing far enough away to have it look the same size as the object and then asking

* Preface to "Elements of Drawing."

him to forget his measures and decide by eye alone whether the drawing is stouter or slimmer than the object. Even before the

FIG. 1.—From sketch by Rembrandt (1607–1669).

eyes have been trained to draw without measures, 90% of the replies will improve incorrect drawings.

4. To see truly you must look quickly from the object to the drawing, and transfer the vision back and forth from one to the other as rapidly as possible, trying to forget that one image is from the drawing and the other from the object. This quick comparison will suddenly enable you to see appearances on the plane of the drawing, and thus realize your mistakes, and the folly of depending upon measures that can never equal your eyes.

5. Tests applied before you draw or to aid results on paper are harmful if relied on more than vision, for the proper use of tests is to train you to see mistakes after your eyes have done their best without the tests. The beginner who must measure in order to continue drawing is as foolish to spend weeks or

months on one drawing as the pianist would be who tried to master Beethoven without spending any time on finger exercises.

Fig. 2.—From oil monochrome.

6. Use the Glass properly and it will show you mistakes more surely in your first lesson than could the best artist. Therefore, in order to improve, there is no need for you to finish your first sketches. Never try to finish any drawing more difficult than an outline from a copy until you have made so many hundred sketches from nature that you begin to see truly.

7. Draw Bulk Instead of Outlines.—The secret of success as draftsman, sculptor, or painter lies in thinking of and representing from the start the diameter or bulk of an object and each of its parts. As long as you look at and draw lines, or edges, you

will fail to represent the bulk correctly. You will never draw well till you stop thinking of lines and edges and continually ask yourself as you draw if your sketch is fatter or slimmer than the model.

8. Fig. 1 reproduced from a sketch by Rembrandt shows how the masters begin to express mass and action by the fewest possible lines. You should study such sketches often until you can think of and work for mass, and are not afraid of getting an extra line. Study of this sketch will bring out horses and men where at first no form is evident.

9. Drawing Should Look as Large as the Model.—The drawing problem is much simplified by placing the drawing in such a position and at such a distance from the eye that it may appear the same size as the object and on the same level. A life size drawing should be placed at the right or left of the object and the same distance away from the eye and the drawing made by memory of observations repeated as often as desired from the chosen position. A smaller drawing should be placed enough nearer the eye to appear full size from the chosen position. To sit or stand and draw from any position upon an easel that you can reach without walking up to it, involves making a small drawing unless the drawing is to look much larger than the model while you work upon it. Unless the drawing looks the same size as the subject it is much harder to see its mistakes. Therefore art school students are often almost forced to measure because they can not choose their positions and the size of the drawing so as to use their eyes. This is one reason why they progress so slowly that only a few of the most talented ones can depend upon their eyes when they finish their art school courses.

10. To draw the size the object appears simplifies the comparison of the drawing with the model for it reduces this comparison to one plane (that of the picture) by making it possible for you to forget that the object is solid and behind the drawing and think of it as if it were a second drawing on the same plane as your own drawing. In thus comparing, however, you should think first of bulk and diameter and never of the details in the contour until you are sure you have the weight and action correct.

11. Limit the Time on One Drawing.—Time spent on drawings that are not corrected is wasted, and so by usual methods the class must finish every sketch in order that the teacher may criticise each drawing. The Glass enables every student to criticise sketches made in even a minute or two, therefore it is wise to limit the time that may be spent on one drawing. First-year students should seldom spend more than one day on one draw-

FIG. 3.—From pencil sketch by Anna M. Hathaway.

ing, and this only at the end of the year. Second-year students will be wise not to spend more than two days on one drawing. The more advanced the student the longer the time that may be well spent on one drawing; most advanced art school students may spend a week or two on one drawing or painting.

Fig. 2 is from an art school drawing made in 1882 by a student nineteen years old who had been in the School one year when the work was completed. The drawing is a monochrome in oil-color and several weeks were spent upon it. The time would have been more wisely spent in many quick sketches with possibly one carefully finished study representing a small part of the cast.

12. Think the Tests.—After a few months of faithful study upon the Glass, your eyes will become so true that when you apply the tests to a sketch on paper, they will show no errors. Then you will begin to omit the tests because you have learned to apply them visually from the very start of your sketch, and more exactly than is possible when you must depend on the spirit-level and thread.

13. This true vision will not insure success as an artist, or the speedy realization of your full power, for this is impossible to youth. No artist who is honest will cease to improve as long as he retains vigor of mind and body, and the chief object of this book is to aid the student to a true vision and vital expression of appearances in less time than is needed by usual methods.

14. Do Not Trace.—The Glass may be used to trace results to paper, but if in earnest you will not do this, or hasten to produce anything to exhibit. If you do not understand that the correct drawing is one which will appear to cover the object behind the Glass, it will do no harm to make a few tracings on the Glass in order to make perspective clear, but you should not transfer these tracings to paper, or make any attempt to draw pictures on paper, until you see well enough to do the work without aid from the Glass or the teacher.

15. The Artist Uses Tests.—When your student-days are over you may use a pencil for a few measurements, or you may use a finder with equal squares to measure proportions. You may even use a photograph if you understand that it is as false in values as it is in drawing and useful as a record of facts not to be copied literally. But you will, if you are wise, never be the slave of any method or science, for the artist has always been in advance of the scientist and always will be, since science deals with the material facts, and the artist, in the person of the inventor and discoverer, has always been busy in overturning accepted theories and replacing them with truer ones.

16. The Artist is Inspired.—Art and invention are due to the intelligence that refuses to accept the orthodox, or any authority that can be disproved. The artist has known the truth before the scientist, because he trusts his own inspiration more than the theories of the Schools. The artist builds a steamer to cross the Atlantic to bring back a book written by a scientist to prove that no boat can be built to carry coal enough to steam across the ocean. The artist discovers the X-ray which scraps all text-books on science; and he builds an aeroplane to show the absurdity of the text-books that state the impossibility of building a flying machine heavier than the air.

17. Text-Books False.—Text-books to this date have been records of the ever changing imperfect theories of their periods, and the future may prove many present theories as false as those we have outgrown. Do not believe the inventions are all made and nature's laws all stated, for the future will record more of progress than the past, and honest students will gain the reward for hard work for ages to come.

When the educator will admit the inspiration of the artist, inventor, and poet, it may be possible for him to modify the inartistic methods that now produce results whose "Superficial pretence actually tended to degrade the taste and to blunt rather than sharpen the observation of the pupils." See Section 266.

18. Practical knowledge can not be gained except from hard work that combines theory and practice, therefore no change of educational methods, or of social conditions or of laws, will ever in fact make men free and equal as students or producers.

Some time in the future the artist, the scientist, and the educator will have more equal influence in our schools. Then ignorance, hatred, bigotry, superstition and selfishness will gradually be outgrown and a real civilization begin which will value intellect more and wealth less, and will therefore offer equal opportunity for education to all who are willing and able to pay the price in work and study.

Prize Drawing, Academy of Fine Arts, Philadelphia.

Fig. 4.—First Prize of $200 in 1919 was awarded John H. Crossman, who entered the Normal Art School in September, 1915, at age of 18. In May, 1918, he enlisted in U. S. Coast Artillery. His first year of study included the use of the Drawing Glass. This competition was open to all Art Schools in the country.

Prize Drawing, Academy of Fine Arts, Philadelphia.

FIG. 5.—This drawing won Third Prize of $100 in 1921. It is by Beatrice Dwan, who entered the Normal Art School in 1918, at the age of 17.
First Prize of $200 was awarded to Ruth Deal in 1920. She entered the Normal Art School in 1917, at age of 17. Her drawing was so injured it can not be reproduced.
Miss Deal and Miss Dwan used the Drawing Glass in their first year.

Chapter II.

DRAWING SELF-TAUGHT.

19. A Perspective Drawing.—An artist tries to create an impression of nature's appearances. Usually he works upon a flat surface. A perspective drawing is one upon a flat surface, which will create in the eye an image exactly like that produced by nature. In other words, if a sheet of glass is set up between the eye and the object, and lines drawn upon it to exactly cover or hide those of the model, when the eye is at one fixed point, the model may be taken away and the drawing on the Glass will still cause in the eye the same linear image that the object produced. Leonardo da Vinci explained the method of making a perspective drawing by tracing it on a sheet of glass, and since this is the simplest method, it has continued in use to this day.

20. Perspective Distorts.—The science of perspective has been understood for hundreds of years, and is as exact as any other branch of geometry. It enables one to draw on paper the exact lines which would be traced on a sheet of glass set up in a given position with reference to the eye, and to an object whose size and relation to the eye is known. Such a drawing will create in the eye an image exactly like that caused by the object it represents, as long as the drawing is viewed from the fixed point from which the object is supposed to be seen. But if it is looked at from any other distance or direction, the drawing will not look like the object, and may often be as much distorted as Fig. 6 which was photographed from nine perfect spheres.

21. The Photograph is a Perspective.—The common photograph is a perspective, since it is the intersection of a plane by lines that converge from the object toward one point. The distortion of Fig. 6 which causes only one of the nine spheres to be represented by a circle, illustrates the difference between the photograph or any plane perspective and what the eye really sees.

Only the small part of a photograph, or any perspective on a plane, that is exactly opposite the eye, is exactly like what the eye sees. This is fully illustrated in Chapter VII of "Free-hand Drawing" by the author, and this chapter shows why dependence upon any method of measuring departs from the vision and the feeling of the artist, by producing the perspective

FIG. 6.—From photograph of spheres and square and circular plinths. Illustrates perspective distortion due to wide angle lens. Eight spheres shown by ellipses will appear round if seen from a point two inches from center of cut.

distortion inevitable when any plane cuts the visual rays to the outer parts of a picture obliquely.

Perspective distortions are not the only reasons for avoiding scientific perspective and mechanical measurements, for those who depend upon them do not train the vision, and never obtain eyes that are trustworthy; besides this, the measurements and tests applied are often so inaccurate as to do more harm than good.

22. Substitute Vision Training for Picture Making.—Glass has been so long used for tracing and mechanical aid to results on paper that those who hear of a new method of drawing on glass are likely to conclude that it is another mechanical system for the artist to oppose. Therefore it is hoped that those who read this book at all, will read it long enough to discover that it does not recommend glass for tracing, or as an aid to results on paper, but for free-hand drawings made without measures to train the eyes to see so closely that the use of the Glass and all other tests finally become unnecessary.

This result is accomplished by using the Glass as a drawing tablet in place of paper. The drawing is made upon it with a specially designed crayon, all measurements and tests being forbidden, also all tracing, the student being required to make and change the drawing by eye alone, until it seems perfect. Then and then only the student may apply the first test given, by holding the drawing up between the eye and the object to see if the lines and proportions of the sketch will perfectly cover those of the object. In this way children as young as seven years are able to see their mistakes and realize that the Glass is not a mechanical device to aid in making drawings on paper but that it gives a scientific test of the accuracy of one's vision. It is the most artistic of all methods, in absolutely forbidding all finished drawings on paper until such time as they can be made without the aid of the Glass or any other test.

23. The Drawing Glass.—This Glass consists of a sheet of clear window glass set in a frame of wood and so held by screws that it may be quickly replaced if broken. A white card slides in grooves behind the Glass so that the drawing on the Glass may be seen as readily as if made on paper. The drawing is made with the "Cross" crayon and erased with a piece of dry cotton flannel or outing cloth.

A spirit-level is inserted in the top edge of the frame to show when the frame is level. This is not used when the sketch is in progress as the lines of the frame give the directions for the horizontal and vertical lines of the sketch, and so when drawing it is better not to look at the spirit-level even when the frame is

held so nearly upright that the level will indicate truly. It will not do this when the frame is much inclined, and you should never think of the level as you draw. The level is, however, absolutely necessary when a drawing is to be tested, as without its aid even the best students will incline the frame and fail to find their mistakes in angles.

24. Do Not Foreshorten the Glass.—When drawing on the Glass it should be held in the left hand as far as possible from the eye, as shown in Fig. 7, which represents a pupil drawing from a cylinder placed at the back of her own desk. The lower edge of the frame rests on the desk. The Glass slants backward

FIG. 7.—Making the drawing.

from this edge away from the pupil so that the plane of the Glass is at right angles to a line from the eye to the center of the Glass. The Glass must always be thus held at right angles to your line of sight, both when you draw on it, and when you test the drawing, for if not looked at perpendicularly the drawing upon its surface will be foreshortened and thus distorted as are the spheres in Fig. 6. The correct position will be given when the opposite corners of the frame are held equally distant from the eye or when the light is such that you can see your eye reflecting in the center of the Glass.

25. Test for Position of Glass.—It is surprising how often students while drawing foreshorten their Glass or paper to the extent of 30° or even 45°. Many students are positive they are looking at right angles to the surface, when the angle is 70° or 80°. A simple test for the position of 90° is given by placing the

unsharpened end of a lead pencil that has no eraser in it flat upon the Glass or paper so that the pencil stands at 90° to the surface. Then if the pencil points to your eye and you see only the sharpened end with none of the curved surface, you are holding the drawing so that you see its actual proportions. If the pencil does not point to the eye, you will readily move the Glass or the drawing board, so that you can see only the end of the pencil. Try this experiment once in a while, until your eye is trained to measure the correct position without this aid.

26. Tracing or Measuring Delays Vision.—You should follow the directions printed on the back of the sliding card and

FIG. 8.—Testing the drawing.

sketch entirely free-hand, without any measuring or pencil tests, and without tracing or using the Glass as a finder. Until your eyes have done their best, you should train them by sketching with the faintest lines you can see, and changing and correcting them entirely by eye, until the sketch seems perfect. Then you should hold it at arm's length, and on the apparent level of the object, so that you can look from the object to the drawing, back and forth, as quickly as possible, in a last effort to see by eye some needed correction. When quite sure the drawing is perfect, apply the final test of looking through the Drawing Glass to see if each line of the drawing will cover the line of the object which it represents. To do this hold up the Glass between the eye and the object, as shown by Fig. 8, and move it back and forth until the width of the drawing covers the width of the object, and then if the height of the drawing covers the

height of the object the proportions are correct, and any failure of the lines of the drawing to cover those of the object shows the mistakes you have made.

27. Size of the Drawing.—The larger the drawing on the Glass the more surely you can discover your mistakes, but you can not make the drawing any larger than the apparent size of the object when measured at the full length of your arm, for you must hold the Glass in your hands to test the drawing. You should make the drawing as large as you possibly can and have it cover the object when held at arm's length. If you make your first sketch too large to do this, erase it entirely and make a smaller drawing, and do the same thing if slight corrections are needed. You will be tempted to erase only the incorrect part, but you should not do this, for your effort is not to secure quickly a sketch that will cover the object, but rather to train your eyes to see truly. Most students make the mistake of holding up the Glass to look through the drawing, without previous effort to correct the sketch by eye alone. This is a serious mistake which will make it difficult to work on paper.

28. To draw well on paper you must train your eyes by discarding all methods which substitute tracing, measuring or any mechanical way of obtaining quickly a drawing on the Glass that merely covers the object. Every drawing on the Glass that does not involve visual and mental training in seeing relations fails to give the education that finally develops power to see more exactly than you can measure.

When you test the sketch on the Glass be sure to have the bubble in the spirit-level visible in the center of the opening and the Glass held just at right angles to the line of sight from your eye to the object. This means that the Glass will be held inclined, except when the object is on the level of your eye, or extends both below and above this level.

29. Objects to Draw on the Glass.—The Glass is to train you to see action, proportion and perspective effects, therefore you should avoid not only small objects, but also large ones that are too distant or have fine detail; for the crayon will not hold a sharp point. Even if it would, you could not test details, therefore postpone such study until you work on paper, and draw simple forms on the Glass at the start, and as long thereafter as is necessary to enable you to see the essential angles and proportions quickly and truly.

Small drawings can not be tested accurately, therefore your model should be near enough or large enough for the sketch on the Glass to nearly or quite cover the Glass. Small objects should almost touch the Glass when the test is made,

and objects less than two or three inches long should not be drawn.

The objects to study must vary with the age of the pupil. Young students may wish to begin with the graded lessons given in Chapter IX. Older students may draw whatever interests them as long as the subject is not too small, or too far away, or too complex in form.

30. Distance of Objects.—The small object must be near the student and the large one far enough away for the drawing to nearly cover the Glass when it is held at arm's length. The nearness of the model when it is on a desk or table at which you sit, as in Fig. 7, is an advantage, for you are not trying at first to produce pleasing pictures but to train your eyes to see truly, and the violent perspective of objects near you enables you to discover and correct your mistakes more quickly than you could if the objects were farther away. Pupils too young to use the Glass when the objects are distant may use it without difficulty when the object nearly touches the Glass.

When your eyes see truly, more pleasing perspective may be obtained by placing objects near you on a box, or a pile of books, to render the perspective less violent.

31. White Crayons for Evening Use.—The mark of a white or bright colored "China Marking" crayon against a dark cardboard is easier to see by artificial light than that of a black crayon above a white card, and you may use any colored crayon and cardboard that you wish.

32. We See in a Sphere.—Fig. 8 shows how the Glass must incline backward to test the drawing, when the object is below the eye. It must incline forward, in the opposite direction, when the object is above the eye, and it must be held vertical when an object is on the eye level. Thus you discover that what you see is measured on a spherical surface and therefore can not be truly laid flat or drawn on a plane surface. This is the reason for the perspective distortion in Fig. 6 and in the corners of any picture that includes large visual angles. You should never draw any object when so near it that the visual angles produced are larger than 30°. This means if you make a full length portrait of a person five feet tall you should stand at least ten feet away from him. The artist who has to represent a subject which causes large visual angles should be influenced by his vision and feeling, more than by science; yet he must represent straight lines in nature by straight lines in his drawing, and therefore he must apply perspective theory to such a problem. This means that he must not represent vertical lines by lines that converge, even when the Glass proves that they appear

to do this. For the same reason the artist should seldom represent long horizontal lines in nature by the curves which he will draw when working by sight and representing each different part of the long line by the angle which it appears to make with the horizon.

The Glass is to train the eye to see the appearance of single objects that do not cause wide visual angles, but it may also be used to give a practical knowledge of free-hand perspective relating to extended visual angles. Even this free-hand study of perspective, however, should not be begun until after the eye has been trained to draw single objects truly without the aid of theory.

33. Holding Glass for Testing.—Before drawing any object learn to hold the Glass to test a drawing on it. Place a pin with a white head large enough to be visible when the pin is in the most distant part of the room, anywhere on floor or wall or any object in the room, and then indicate a point on the Glass by fine vertical and horizontal lines that intersect. Next, hold the Glass at arm's length with the spirit-level in the upper side of the frame. Hold a short edge of the frame in each hand, face the pin, and extend the arms equally, inclining the Glass so that it is exactly at right angles to a line from the eye to the pin. Then, having one eye closed, move the Glass so that the mark on the Glass will appear to cover the head of the pin. When this happens, look at the spirit-level, and if the bubble is not visible in the center of the sight, move one hand slowly up or down until the bubble remains in the center of the sight. See that the point on the Glass still covers the head of the pin. A small piece of paper may be placed upon a common pin for this test.

34. Testing Angle of a Line.—When you can hold the Glass level so that a point on the Glass will cover the head of the pin in any position in the room, represent on the Glass any horizontal retreating line. Select any long line of the ceiling, wall, or the top of a door or window, but do not select a line that is not foreshortened. When you have drawn the line on the Glass, test its angle by holding the Glass at arm's length and at right angles to a line from your eye to the center of the line that you are representing. Hold the Glass so that the bubble is visible in the center of the level, and then move the Glass to see if the line on the Glass will appear to cover the line that you are studying. If it can not be made to do this you will realize the mistake in its angle; and should erase the line and try again, until you have the correct angle.

35. Testing the Angle and the Length.—When able to see the angle correctly you should measure the length, in addition to the angle, by making the line on the Glass of such a length

that each end of the line on the Glass will cover the corresponding end of the line that you are drawing. While testing keep the bubble in the center of the sight and the Glass at right angles to your line of vision.

36. Foreshortened Circle.—The next step is to represent a foreshortened figure. The circle is the simplest for the first lesson. Select a child's rolling hoop or the top of a circular table and draw its appearance on the Glass without any measuring of proportions. Then hold the sketch at arm's length and compare it with the object, to see if you can not change the proportions by eye. When as perfect as you can see, slide out the card and raise the Glass, and move it back and forth between your eye and the circle until the width of the drawing covers the width of the circle. (See Fig. 8.) When this happens, if the height of the drawing does not cover the height of the circle your mistake in proportion is evident. In making this test you must level the Glass by the spirit-level, otherwise you may think an inclined ellipse will represent the horizontal circle.

Repeat this exercise, placing the circle at different levels, below and above your eye and in various inclined positions.

37. The Foreshortened Square.—Place a card 12 in. square flat upon the top of a square or rectangular table, and draw the card on the Glass until you are able to make a correct sketch. Then give yourself a systematic drill in judging angles by sitting in one position, from which you can look at the card in a direction oblique to the edge of the table and then draw the card in all possible positions in which it can be placed with reference to the edge of the table. If you made the first drawing from a position directly in front of the table, you will find the second position much more difficult, for the edge of the table appears horizontal when you are just in front of it, and inclined when you look at it obliquely, and you confuse this angle of the edge of the table with that of the side of the square. After you have made a correct drawing of the square in its second position, mark its position on the table, with a fine chalk line, then draw another line at an angle of 15° with the first, and move the square up to this second chalk line. You can get the angle of 15° by trisecting one of 90° and then bisecting an angle of 30°. Cut an angle of 15° from cardboard to enable you to move the square five times more, and have the last move bring the square back into its original position. Draw the square in each of its six new positions without changing your own position. Repeat this exercise until you find it is impossible for your eye to be deceived by lines that are in front of, or behind those of the object you are drawing.

38. Change Your Own Position.—Now try the same problem of the square upon the table top. Place the card at an angle of 15° with the edge of the table and then draw the square from any position. When the sketch is correct, move yourself 15° in either direction around the table, but do not move the square. When the square is correctly drawn for the second time, move yourself 15° more in the same direction as before, and so continue to move around the table, and the square, until you have drawn the square from 24 different positions 15° apart in a circle around the square and table. This exercise and the preceding one will give you more power to see perspective effects truly than years of study by usual methods.

39. The Square and Table.—When you can draw the square readily, you may repeat the last two exercises, drawing both the table and the square. There is no reason why you should not draw a cube or a box instead of the square card. These exercises should give you power to draw any object in two dimensions,

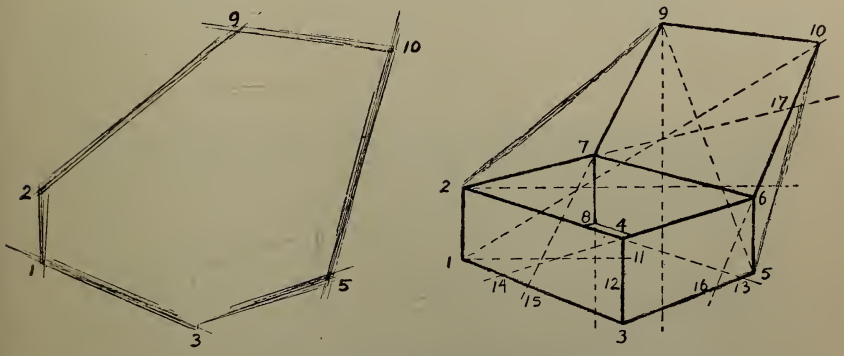


FIG. 9.—Blocking-in lines and tests.

or any solid; for all objects are seen as if they had but two dimensions. When you can judge height, width, and angles correctly, you can draw anything. This drill from geometric forms makes your progress more rapid than it would be if you began with casts, or the life model, for you can not correct such drawings as closely or as quickly as those from geometric forms.

40. Blocking-in the Solid.—When the subject is a cube or a box as in Fig. 9, you should not begin with any single edge, but with the mass of the whole, as if the box had only the two dimensions that can be represented by the silhouette of the box. Do not make the common mistake of drawing all the lines forming

FIG. 10.—Examinations by the same student showing gain made in 60 hours.

this silhouette, but substitute one long line for two or more short lines that break into the mass. Thus you avoid all concave breaks into the convex form that will result by connecting the outer corners of the object with the fewest possible lines that will enclose the drawing. You should always avoid all detail in the blocking-in lines, for detail should be studied last.

All that you should do, by the blocking-in lines that give what is called the "primary mass," is to indicate the height and width of the drawing, and its position on the Glass. This you could do by two horizontal and two vertical lines, or even by four points, but it is better to indicate the longest lines that will enclose the mass of the silhouette, for their angles assist in determining the proportions correctly.

41. Study the Arrangement.—The blocking-in lines determine not only the proportions of the drawing but its size and arrangement on the drawing tablet. These first trial lines should be as light as possible in order that you may change the size and position of the sketch without erasing, and may work upon the Glass exactly as you must later work upon paper. Drawings on paper will record all mistakes in the size of the drawing and its arrangement on the paper. You should, therefore, try to make the drawing on the Glass of such a size, and in the position which will produce the best possible composition. This will aid you in your later work on paper.

When the "primary mass" is as correct as you can see when holding the sketch at arm's length and looking quickly from it to the object, test by looking through the Glass. If it does not prove true, erase the entire sketch and try again until the blocking-in lines give the correct proportions.

42. Proportion More Important than Detail.—Since the lines inside the silhouette do not determine proportion as quickly as the blocking-in lines, it is wise for you to make an extended series of sketches that go no further than the blocking-in lines, until you find yourself able to sketch these truly at first trial. If the desire to finish a picture is stronger than your wish to establish the solid foundation of real visual power, you may represent all visible edges. The Glass is a sure teacher, and even if you do not use it in the best pedagogical method, it will perform its mission, and correct your vision, if you persevere in its use. Interest in your work is more important than the subject that you study, and if your interest in any special subject impels you so strongly to draw it that you can not maintain your interest in the geometric subjects which I have advised at the start, by all means try the thing in which you are interested. Doing this will aid you to realize the greater value of the sub-

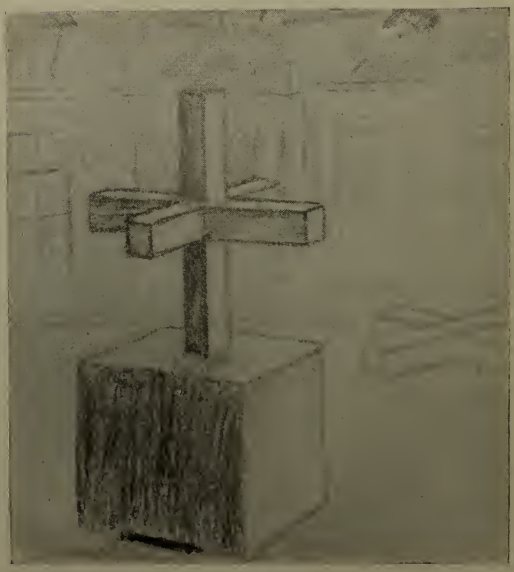


FIG. 11.—Examinations by the same student showing gain made in 70 hours.

jects which I have advised, and you will go back to them with renewed interest.

The educator emphasizes the necessity for studying objects

Fig. 12.—From drawing by Michael Angelo (1475–1564).

in their proper order and drawing each by definite steps. The Drawing Glass simplifies this problem greatly, and most of what I must tell you in order that you may become draftsmen and painters through study in your own homes, relates simply to the proper use of the Glass, and to artistic methods of work on paper. The subject and details of steps, stages, and methods are unimportant.

By this time you should be able to sketch so well on the Glass that work on paper is advisable. For a long time, however, after you begin to draw on paper you should take up the Glass often, and practice on it for a few minutes. A student recently

FIG. 13.—From sketches by Paul Potter (1625–1634). Study the faint beginning in lower right corner.

Fig. 14.—From sketch by Hans Holbein (1460–1524).

told me that he found the Glass so helpful that in addition to the twenty hours of class-room drawing from the antique done in school each week, he found time for twenty hours of practice at home on the Glass. This spirit and enthusiasm will bring success to those whose work must be done wholly at home.

43. Sketching on Paper.—We see edges and represent them by lines and so naturally we draw, erase, and correct lines one at a time, but until the last is drawn we can not see the proportions of the drawing. The fatal mistake of elementary instruction is in permitting this false method to continue. Correct bulk and action will never result from the customary study of details at the start.

44. The Masters' Methods.—Study the photographs of the old masters' sketches, Figs. 1, 12, 13, 14 and 15, and see how they began with faint suggestions of the masses, and made corrections without erasing by drawing stronger lines that neglected details, and expressed action and proportion. If you would succeed you must adopt this method and cease to draw detail until you have first found the place for it, by the blocking-in lines that are essential to true proportion.

45. Discard the Eraser.—Do not use the eraser at all for months, but see how many changes in mass and action you can make in a few moments, by ceasing to draw slowly with finger motion only. Instead, sketch freely and joyously from your shoulder without moving the fingers at all.

46. Sketch Instead of Draw.—The beginner wastes years before he finds out that he should sketch before he draws, and that he should find the place for the final drawing by making many sketches straight from the shoulder, one on top of the other, each a little stronger than the preceding and a little truer in proportions. See Figs. 1, 12 and 13.

47. Get Away from Your Sketch.—The beginner conscientiously bends over his drawing that he may see each touch as it is produced. After a few years thus wasted he discovers that he can see the action, proportion, and effect, only when he is far away from his work. Keep at least at arm's length from the drawing and give yourself a chance to sketch from the shoulder. It is said that Whistler used to paint with brushes whose handles were six feet long. Every artist studies the effect of both subject and picture from the greatest distance possible in his studio and often doubles this distance by use of a large mirror.

48. Paper.—The paper for the practice sketches may be of the cheapest kind on which a pencil will mark without tearing its surface. Cheap copy paper costing by the ream about one cent for five or ten sheets 8½ x 11 inches will answer for the

Fig. 15.—From sketch by Raphael (1483–1520).

hundreds of sketches you should make in from one to five or ten minutes each. Later work may be upon cheap white drawing paper such as is used in the public schools. This should be 12 x 18 inches, and fastened upon a board of the same size by a thumb tack in each corner.

49. Pencils.—Provide the six soft pencils B, up to and including 6 B, also the medium grades H, B and F; and the hard pencils H, 2 H, and 4 H. You will need this variety when you begin to make pencil paintings of light and shade and color values. For outline only you will not need so many soft pencils.

Avoid using a short pencil unless you place it in a crayon holder.

Hold the pencil as if it were a stick of charcoal with its unsharpened end at the center of the palm of the hand, as shown by Fig. 16.

FIG. 16.—From photograph.

When sketching use a pencil that is hard enough to enable you to obtain the correct result without any use of the eraser. When you erase from the start you prove your ignorance, and you fail to get the best training or the best results.

A hard pencil may be used lightly enough to make all needed corrections without indenting the paper or getting it so black that you must erase in order to continue. When this condition does arise do not use the eraser, but start anew on a clean piece of paper, and avoid this condition in future by using a harder pencil or less pressure on the paper.

As your vision improves you can use softer pencils, and you should always use the softest ones that enable you to get results without use of the eraser. The hard pencil, except in the preliminary sketching, produces a sharp mechanical line and effect which is not pleasing in a free-hand drawing.

50. Free Arm Movements.—Before drawing objects on paper, overcome the slow mechanical method of drawing with motion of the fingers, by frequent free-arm sketching of straight and curved lines, using the entire arm and moving the shoulder joint only.

In this practice and also when drawing objects, do not take the pencil point off the paper, but cause it to make a faint mark in all its movements back and forth along all the lines of all the objects.

Practice first on the horizontal line and see how close to the first line you can place the others. Sweep the pencil rapidly back and forth across the paper many times until you have a series of lines producing a band a quarter of an inch or more in width. See Fig. 17. In the same way practice the vertical movement, and then the oblique in various directions. Then try the circle, and both wide and narrow ellipses.

Repeat these exercises daily until you can sketch a straight

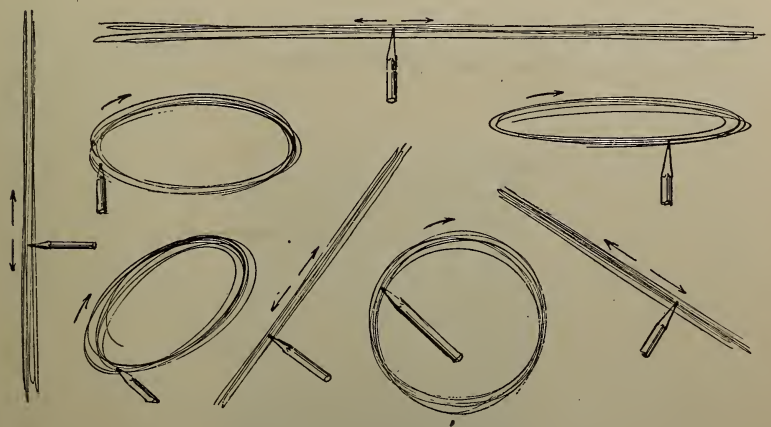


FIG. 17.—Free arm movements.

line or an ellipse in one instant, and with one touch. Do not imagine, however, that you must postpone drawing objects until you have gained this facility, for these exercises may be repeated once in a while with interest and profit years after you have begun to produce and exhibit pictures.

A French artist once said that you should be able to sketch a man falling from a building while he is in the air. Spoken before the advent of skyscrapers, this expresses the spirit that should direct your efforts, and you must try to develop speed that enables you to sketch lines in less than one second.

51. Many Lines Desirable.—It is useless to expect correct results or details at the start. In beginning give up the idea that you are drawing and simply try to locate the place where later you are going to draw. Many trial lines are desirable, not

only because they permit repeated efforts to give correct results, but because they enable you to experiment freely, and finally to take your choice of the best line among many. You are free to experiment by accenting first one and then another of these trial lines, and you may finally strengthen and retain one of the earliest touches. Until you adopt this method and refuse to be satisfied with one clean sharp line for each edge, you have not taken the first necessary step in the training of the artist.

Do not multiply lines without thought or observation, but make as many changes as possible by means of tests applied visually that cause you to think horizontal, vertical, and oblique lines through every point and mentally continue every straight line to intersect other lines. Gradually select and strengthen the best lines. If, in spite of the use of a hard pencil, you get so many lines that you can not make the needed changes without erasing, throw the sketch aside and start one that can be perfected in proportions without the eraser. Inability to sketch without

FIG. 18.—From photograph.

use of the eraser proves that desire to tell the exact truth all the time, which distinguishes the mind of the scientist from that of the artist. The artist must neglect the details at the start if he is properly to relate them to the whole.

52. Position of the Drawing.—The drawing block or board should be supported on an easel or a chair at right angles to a line from your eye to the center of the paper. The drawing board may be supported on the lap by use of a lap easel that is

clamped to the top of the board and extends to the floor to hold the board from falling. See Fig 18. If you have not an easel or chair to use in its place, hold the drawing board in the left hand as far as possible from the eye.

53. Objects to Draw on Paper.—The subject is not as important as the method by which you study it, but if there is a choice it favors the use of geometric forms in beginning, for these are not only always at hand but they make the best method of drawing easier to grasp than the forms of vegetable and animal life. Therefore I advise the same forms as those which you have studied on the Glass and for the first problem the box of Fig. 9.

54. Sketching a Box.—Sketch first the primary mass, see Section 40. When the sketch seems perfect in its proportions test it by use of a thread and the Glass. Hold the thread tightly stretched across the Glass between the hands. Hold the Glass so that the bubble remains in the center of the spirit-level, and then move the thread about on the Glass until it forms a straight line covering points 1 and 10 of the box. Having thus measured the angle of the diagonal 1–10 hold the thread firmly in this direction upon the Glass and place the Glass flat upon the drawing so that the sides of the frame are parallel to the edges of the paper, and the thread covers point 1 of the drawing. If the thread also covers 10, then these points are correctly placed. Next measure in the same way the angle of the diagonal passing through the lower right-hand corner 5 of the box and the upper left-hand corner 9 of the cover.

These tests will determine the proportions without the waste of time due to placing detail in the wrong place. Therefore it is better not to finish the first sketches by the lines within the contours, but to sketch simply the primary mass until you can do this readily and accurately, and only then to represent the lines inside the contour. When you have done this as perfectly as possible by eye alone, test the drawing by taking a horizontal line with the aid of the spirit-level and a thread held horizontal on the Glass to cover point 1 to note the position of the point 11 in the front edge of the box where the thread through 1 cuts it. Then take a level line through the right-hand corner 5 to obtain the position of 12 in which the thread cuts the front edge. In the same way pass horizontal lines through the other corners of the box to determine their levels. Then with a plumb-line made of a thread tied to a lead button, take a vertical line through 9 to see its position between 3–4 and 5–6. Take another vertical through 7–8. As a last test hold a thread taut in both hands between the eye and the box so that it covers the edge 4–6, and then notice where the thread intersects edge 1–3 in 14. In the same

way, continue 2–4 to intersect in 13. Then continue the inclined edges 7–9 and 6–10 to note their intersections 15 and 16 with the lower lines of the box. In this way continue the other lines of the box, and if they intersect in the drawing as the thread appears to intersect the box, you may be sure the sketch is correct. Make all changes indicated by this use of the thread without any use

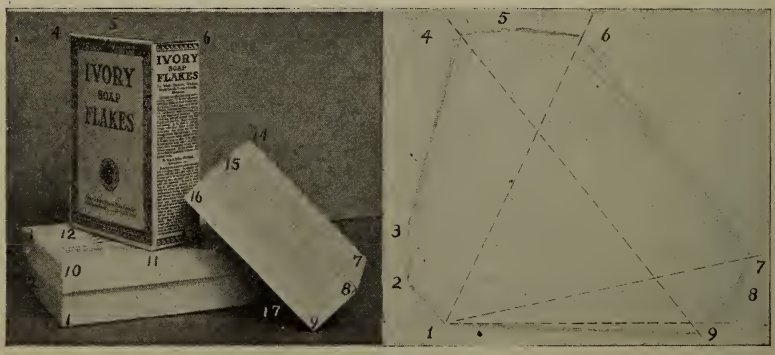


Fig. 19.—From photograph.

of the eraser, and continue to draw single objects until the tests prove that you can draw them correctly by eye.

55. Sketching a Group.—Arrange several boxes in a group similar to Fig. 19 and when you have sketched the primary mass draw within it the primary mass of each box, thus representing the "secondary" masses. Fig. 20. Before going further, it is wise to use the spirit-level and a horizontal thread on the Glass to find the levels of points 1 and 9, and 3 and 7. Make corrections without use of the eraser and then sketch the inner edges of each box.

56. Draw the Objects at the Same Time.—Draw the longest lines of all the boxes first, and the shortest, last. Do not allow one object to become more advanced than the others. Do not look only at the object or line you are drawing but at those around it, for as long as you look at one line or one object, you will not represent it in the right place or of the right proportion.

After you have blocked in the mass of the entire group and then within it the mass of each object, thus obtaining the secondary mass, Fig. 20, draw next the longest lines that are easiest to see and relate, and then the lines of intermediate length without regard to the object they define. Never finish one object until the others are nearly as far along. Think of all the objects as

parts of the same object, neglecting the shortest lines of all the objects until all the long lines are drawn. Fig. 21.

Shift and twist and change without any erasing until your eye can do no more. Then take the Glass and a thread and pass a horizontal line through every corner of every box to note the levels of these points. Change as soon as the test shows an error.

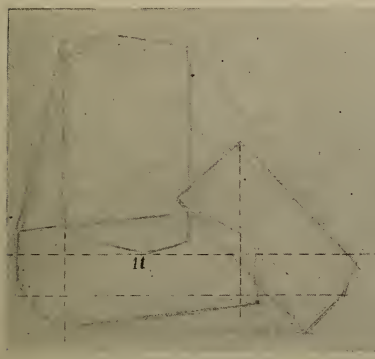


Fig. 20.—Secondary masses.

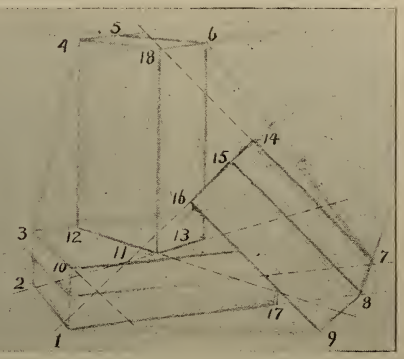


Fig. 21.—Testing sketch.

Then with the plumb-line pass a vertical line through every corner, and change as fast as these tests discover mistakes. Finally, continue every long line of every object to see where each line intersects the other lines. Do this by holding only the thread taut between the two hands and in front of you as if it were resting on the Glass held for testing, and then revolve the hands until the thread covers any line, as 7–14, and cuts the contour near 18. See if the drawing agrees by placing the thread flat on the drawing to cover 7 and 14. If it does not intersect in the proper point near 18 the sketch must be changed until it does.

It is impossible for an error to remain undetected if all these tests are applied, and you must use them all until they train you to think horizontal, vertical, and oblique lines, through every point as you sketch, and also to think the lines continued to intersect others. When you think these tests you will draw so truly that the use of the thread and level for corrections will discover no mistakes, and soon you will find your eyes are more exact than the tests which you will no longer need.

57. True Levels Important.—A sketch whose proportions are correct will look incorrect if its levels are wrong. The artist fails on levels, that is, on perspective angles, more than on any other subject. You should take special pains when testing levels,

and never trust to holding a pencil or ruler by your eye. The spirit-level is the only sure test for angles. The best way to use it is to make cuts in the opposite sides of the frame that will hold a thread exactly parallel with the top edge of the frame and about two inches below it. Make the cuts deep enough with a sharp knife so that they will retain the thread, and when you use it face the object and stretch the arms out equally and be sure the bubble remains in the center of the sight. Do not try to use the level to test the drawing, but place the thread alone flat on the drawing and adjust it by eye so that it is parallel with the edge of the paper.

58. Still Life Best for Beginner.—No subject will give true eyes for perspective as quickly as these boxes, and you should continue to draw them until you can sketch a half dozen of different sizes and proportions in five minutes so correctly that the tests will discover no mistakes. Use small paper boxes on a table part of the time, and larger wooden boxes on the floor in later work.

59. Honest Training in Place of Dishonest Pictures.—Until elementary drawing means vision training instead of picture making, it will require courage to make sketches while you know other students are making finished pictures. If you are able to carry out these directions you will some time be as grateful for them as are my personal students, who often tell me that this study from the boxes helped them more than any other work in their entire course and finally enabled them to draw the figure better than students who had spent all their time on the antique and life. See p. viii. and Figs. 4 and 5.

60. Draw the Background Instead of the Object.—When you can draw the boxes, study a chair by sketching first the blocking-in lines, and next the background spaces composed of the bits of floor or wall seen between and through the rounds, legs, and other parts of the chair. In other words, draw the holes instead of the parts that bound these holes. See Fig. 22.

This is the best of all tests because it can be applied without thread, level or Glass, far more exactly than you can see the solids. You know the solids and this prevents you from seeing their appearance. The background spaces or holes have no real existence or form for you to know, and so you can believe your eyes about their appearance long before your eyes are true for the solid. Students who adopt this method soon excel those who continue to draw the legs and rounds.

61. Accenting the Sketch.—You should now finish a drawing occasionally in outline or values, as desired. If in outline, erase the trial touches and accent the final lines with one stroke of a

Drawings by the Same Freshman.

Entrance Examination September 28. Faulty in Proportion and Perspective.

Examination November 30. Better Proportions and Perspective.

Shows artist's way of sketching background spaces instead of the solid parts.

Fig. 22.—Drawing the holes instead of the objects.

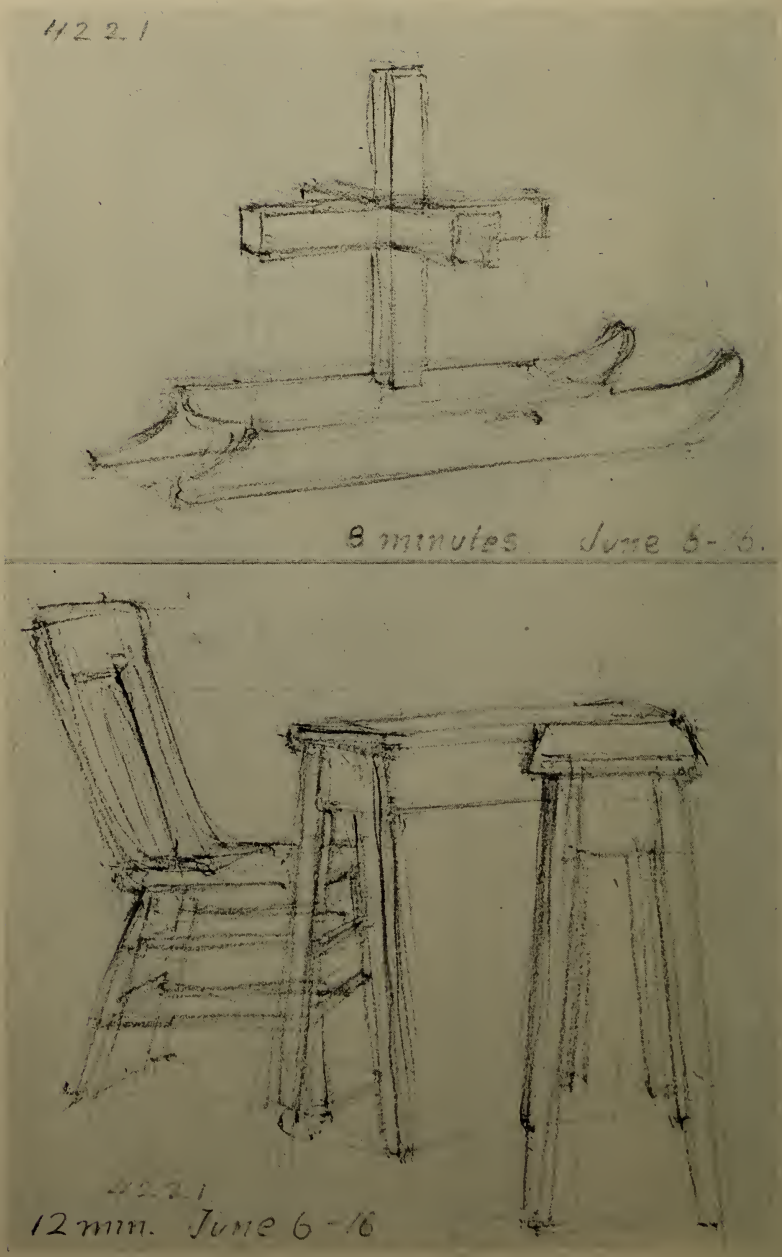


FIG. 23.—Freshman sketches showing blocking-in lines.

FIG. 24.—Ten-minute sketch by Anna M. Hathaway showing blocking-in lines.

soft pencil which produces a soft gray line, except where you need a few accents of black.

In accenting hold the pencil as you desire, and move it from the fingers, wrist, elbow, or shoulder. Accent the object forms and their construction, and be sure not to accent the background forms that aided in the drawing. These forms are too pronounced in Fig. 22 because the sketch was barely started.

There is no rule for accenting except to make the sketch effective in presenting the important objects, their relations and construction by the greatest possible variety in the strength and the width of the lines employed. You must use your judgment, for any rule will produce mechanical results. You should omit all unimportant details and bring out the nearest and most important parts with the heaviest lines. Do not think this means any regular gradation from front to back, for such would be fatal to an artistic effect.

62. Interiors and Street Scenes.—When you can draw groups of furniture represent the room, and then draw everything that interests you, in-doors and out-doors. You will find that a little practice will enable you to draw human and animal forms from the cast or from life as well as you draw the geometric forms. This proves the wisdom of beginning with the geometric forms, for many artists who draw the figure well fail in subjects that are geometric.

63. Use a Sketch-Book.—Carry a sketch-book with you all the time for use in minutes that would otherwise be lost. Use this book from the beginning of your study, and do not think that you must master each problem in the order that I have given it before you try any other subject. Every subject trains the vision when it is rightly studied, and so you may draw in your sketch-book anything that interests you, including casts, figures, animals, and memory drawings, as well as any nature study.

64. Make Color Sketches.—Do not try to master drawing before you begin to paint simple subjects, but work in color often enough to prove that you need to draw most of the time until the drawing does not trouble you when you paint.

65. Detail Important.—When you can represent mass and action, you must begin to study detail as if it were most important. You should study reproductions of paintings by Meissonier, Charles Bargue or any good miniature painter to see how it is possible to keep the strength and breadth of the masses and still represent all essential detail.

66. Figure Drawing.—Do not think your training is over when you can draw still life and geometric subjects easily, for

this is the simplest of your problems and given first in order to prepare you quickly to draw the figure well. The figure you should sketch as you have the boxes, beginning with the blocking-in lines of the whole and then giving those of the smaller masses. See Figs. 1, 12, 13, 14, 15.

67. Avoid Fads.—Do not be misled by exhibitions which often present brutal or freak results, for this work will be forgotten in a few years, while if you can learn to draw, model, color, and express character and sentiment, your work may in time hang in the galleries with that of the masters of the past who have been inspired by love of truth and beauty.

68. Art School the Beginning.—If it is not your pleasure and recreation to draw and paint, probably you would better choose some other vocation. If your work is not a joy to you it can never give joy to others. The best is always done for the joy of creating and for no other reward.

I do not mean that you should not find time for recreation, sport, or social life, for you must take your thought from art often enough to rest your eyes and refresh your mind. I do mean that you must make your art study your chief thought and interest in life, and that you must give your whole heart and soul to it while you are engaged in studio practice or in study.

Examination by first-year student.

Chapter III.

PAINTING SELF-TAUGHT.

69. Color Perception Rare.—We are born color blind, and very few ever overcome this defect. All the painters in the world were blind to out-door effects until the early part of the nineteenth century when Constable and a few other English painters broke away from the false traditions of all earlier painters of landscape, and began to represent the light and color of landscape effects. Turner was said to have lost his sense of color, or his mind, or both, when he began to use color instead of the browns of all early landscapes.

70. This failure to see truly is due to the fact that the student has had no science to aid him to true vision, and has thus depended on his teacher's eyes or methods. If the artists of the past saw the light and color in landscapes, they were either afraid to believe, or afraid to paint what they saw, and so the false conventions of their teachers were continued. Today, for the first time, we have a test that will make color appearances visible to a child, and enable the art student to discover his mistakes in values and color, even more readily than he finds errors in drawing by the aid of a spirit-level.

71. Sir Joshua Reynolds explained how to see color in the following paragraph from Discourse XI. "Excellence will never be acquired by an artist unless he has the habit of looking upon objects at large and observing the effect which they have on the eye when it is dilated and employed upon the whole, without seeing any of the parts distinctly."

This clear statement has not been understood by artists or students, and so the most talented have often had to struggle for twenty years to realize the great difference between the actual colors of objects and their apparent colors when influenced by light and shade, contrast, reflections, and distance. Chapter II of "Color Study" by the author explains these color changes, and shows that the eye sees the actual local color less often than it sees the actual form of any object. This happens because the apparent form is always the same as the actual form unless there is foreshortening, and a circle will appear a circle even if a mile distant, unless seen obliquely. To see the actual color, however, it must be very near the eye, and not influenced by light and

shade, contrasting colors, or reflected lights from other objects. This makes it practically impossible ever to see such a thing as local color, for all color appearances are in the eye of the observer, and continually changing.

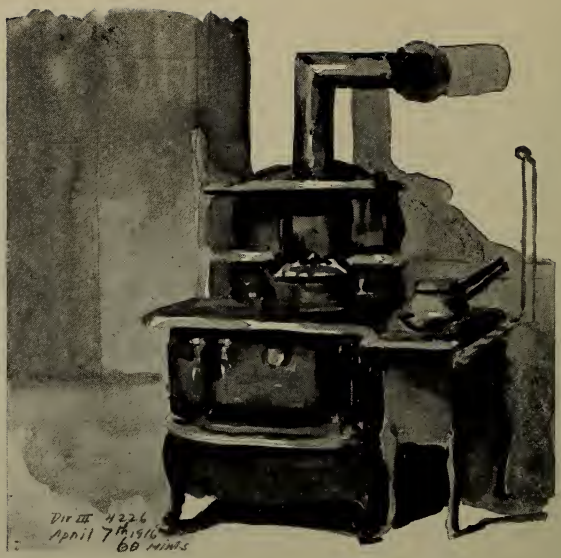
72. The Blur Glass.—An aid to the vision described by Reynolds is the most important problem for the teacher or student. Thirty years ago I found that a magnifying glass that would blur away details and show simply the big masses, was a great aid to students who could learn to *look at* the image on the lens instead of *through* the lens. Many students could not do this, and looking through the lens they strained their eyes and still saw the detail, which the lens was intended to take out, and the actual colors instead of the apparent colors. To enable all students to see apparent colors and not to exaggerate detail is a problem only recently solved by the use of two blur glasses.

73. The Painting Lenses.—These consist of two magnifying glasses mounted side by side in the lower piece of the frame of the "Drawing Glass," or in a special adjustable frame for artists' use.

Drawing or painting from a copy is so easy that almost any one can copy with but little training, and copy very well, even when not able to work at all from nature. This is because the comparison in copying is between the copy and the original which are both on flat surfaces and beside each other, while in painting from nature the comparison must be between the two dimensions of the drawing and the three dimensions of nature. The most talented student can not reduce the solidity of nature to its appearance on a picture plane without many long years of study, while by usual methods the average student never does it.

The painting lenses enable the beginner to see with the master's vision as soon as he succeeds in *looking at the lenses* or rather between them instead of *through them.* By closing one eye and looking between the two lenses, it is easy to observe the images on the lenses as if they were pictures painted on the glass.

The lenses are used by holding them up between the eye and the object so that the object may be seen in one lens while the drawing or painting is seen in the other lens. The painting must be placed a few feet away from the object. You must close one eye and with the other see both lenses equally in the same glance. You must forget that one reflects the subject and the other your picture, and see simply two equally blurred pictures side by side, and *on the lenses* instead of *behind them.* Thus you may gain in one lesson the blurred all-over vision that Reynolds described, and see better than many artists ever do. This may appear a strong statement, but that you may realize what the right use of



Brush drawings by the same student. The upper made April 7, before use of Painting Glass.

FIG. 25.—Made April 11, aided by Painting Glass.

the lenses will mean to you, I will tell you that in a public lecture recently given at the Art Museum, the lecturer, a noted artist, said that one lesson with the aid of the Glass would give knowledge that could not be gained in years of study without this aid. Another artist said to me recently that many well known artists were using the Painting Lenses, so you need not hesitate to use the method that has been approved by the best painters.

74. It seems a simple matter to use the lenses as described above, but even after personal explanations and after reading the directions on the back of the Glass which tell how one eye must be closed all the time, and the other used, not alternately on one lens and then on the other, but equally on or rather between both, I have known adults to use the lenses for many months before they gained the proper blurred vision of one eye that sees the blurred pictures on the lenses instead of the drawing and the subject behind the lenses. Therefore, I will repeat these directions at greater length, and say that if you will follow them exactly there will come a moment in which you will suddenly be born again visually, and see color appearances truly, instead of the local colors that you know and believe you ought to see. This new vision will transform your work from the hard, literal rendering of the facts you know to be before you, to the vision of the masters who have painted the beauty of light, color, and atmosphere.

True vision is not a question of years of study so much as of inspiration that is often instantaneously effective in transforming the vision permanently, so that after this inspired moment there may be little need for the lenses. It is possible that Art School students may not need to use the lenses often when they enter Art Schools having been prepared to draw in the Grammar School by use of the Drawing Glass, and to paint in the High School by use of the Painting Glass. Still many of the best painters find the lenses helpful, and so they may be to you occasionally through life.

75. Use of Lenses in Painting.—Arrange a group of still life so that the light falls on it from a north window and comes from over your left shoulder in such a direction that when you place your painting a few feet to the right or left of the group, it will have as strong a light upon it as falls on the group.

Whatever the medium you use you should try to get the entire canvas covered as quickly as possible so that it will present the same masses of light and shade or color as the subject. Therefore, before beginning to paint, you should study the effect by looking at the subject through one lens, moving the lens back and forth

until the subject fills the entire lens. Then you should stop *looking through it* and *look at it*, or rather in front of it, and study the blurred colors seen, or rather felt upon the lens, until you are sure of their colors and values.

It is better for you to use the lens than to partly close your eyes, for doing this shuts out the light and the color, while the lens will show you so much color that you can hardly believe it the true color needed in your picture. When you have gained a strong impression of the colors and the effect, so that you can lay in the effect from memory, cover the entire canvas with color to all the outer edges. Do this as quickly and strongly as possible, and when the canvas is fully covered and you can not improve the effect, place it far enough to the right or to the left of the group for you to see the group through one lens and the painting through the other lens. Then having closed one eye, use the other to see both lenses equally with a blurred vision that is directed midway between both lenses. *Do not move either the lenses or the eye in order to compare the blurred pictures of the drawing and the subjects.*

76. Look Between Not Through the Lenses.—When you have thus varied the distance of the painting from the subject, and the distance of the lenses from the eye until you can see the painting through one lens and the subject through the other, *you must stop looking through the lenses and look between them so as to observe them equally at the same time with one eye.* The lenses blur the detail, and the effort to see the lenses without moving the eye from one to the other blurs the images still more, and takes out all except the masses of light, dark, and color that are important in the effect.

When you look between the lenses you can forget the drawing and the subject behind the lenses, and see their effect on the picture-plane of the lenses. This vision enables you instantly to see if your painting blurs differently from the subject; if it does, you realize what you must do to make the painting blur like the subject, before you begin to put in the detail.

77. This vision does not strain the eyes, for it is not the trying effort to see detail but the unlabored vision with which you might see a landscape if nearly asleep, and not looking at any object but barely aware of the lights of the sky and foreground, and the dark of the shadowed forest.

Possibly this idea of seeing when nearly asleep will help you to get the right idea of the all-over vision that is needed to paint well. The eye is an exact automatic and scientific machine which adjusts itself quickly to see sharply a minute part of the object before it. All points except that on which it is focussed

Drawings by the same freshman showing the gain made in four months.

Outline, January, 2¼ hours. FIG. 26. Brush drawing, May, 2 hours.

are seen in the blurred way that is essential for the artist. Therefore you must not look at the detail you want to paint, and you must not look at the lens but in front of it, or if two lenses are used, you must look between them. In other words, you must not *see* either the group behind the lens or its image on the lens, but must *feel or be aware of* a blurred image that may be in front of or on the lens, but never behind the lens or on the object.

This comparison of the effect of the subject and the painting is the most important service given by the Painting Lenses, for it teaches you to see simply, to subordinate details, and to see on your picture-plane instead of on the objects. The Glass is also useful for the study of details, and especially for the color of glitter lights as follows.

78. Mass and Detail Both Necessary.—Do not think that you are to leave your picture in the blurred way in which you see nature through the lenses, for you must give careful drawing of all action and construction, and especially of the sharp beginnings of the cast shadows which are lost by the lenses. You must give the effect seen by the use of the lenses, and also the important detail which you see when you look for it without the use of the lenses. Your finished picture with all needed detail will, however, lose detail when seen through the lens just as the other lens blurs away the detail in the subject.

79. Color of Glitter Light.—This light is generally made too bright and white. To realize that it has much color in it, hold one lens so that the glitter light is magnified to fill or nearly fill the lens. You may need to get near the object for this to happen, and thus show you the strong color which the high light appears to have. It may help you to see color in the high light if you realize that this light is a reflection of the source of the light, and would be the color of this source but for the local colors of the object and others around it. Thus the glitter light on a red apple is often quite blue, and it is always a different hue from that of the adjacent parts.

80. Mass of Shadow.—You can determine the form of the dividing line of light and shade that separates the light mass from the shadow mass on any object by getting near enough to cause this object to blur and fill one lens. Then you will not only realize the light and dark, but the colors of these masses, one being warm and the other cold.

81. Object and Background Relations.—Hold one lens near enough to the group to cause half the lens to reflect any object and the other half to reflect the background, and then look at the lens and you will see which is the darker and which is the warmer.

Any two objects, values, or colors may be thus compared by making both fill the whole of one lens if the two are adjacent, or if they are removed in the group by getting one to fill one lens and the other to fill the other lens. To do this you may get as near to the group as may be necessary, but do not look at it from a new angle.

82. Color Easier than Drawing.—Thus used the lenses make color perception easier than drawing, and so encourage you to gain the ability to draw which must underlie real success in painting.

Most art students desire to paint, and the long years of study of drawing generally necessary become a trial. I have found that the lenses encourage students to keep on with their drawing, for I now give my first-year art school students instruction in both drawing and painting from the start. Use of the lenses for a short time proves that they can paint so much better than they can draw that they prefer to give up color study and concentrate on drawing.

83. Color Changes.—Correct values or relations of the lights and darks of a picture are important, but of greater importance are the changes which are made in color by light and shade and contrast effects. The student expects to paint a red apple with different tones of the same red pigment, and a blue vase with light and dark tones of the same blue pigment, but after study of objects of various colors by the use of the lenses it will be seen that the color changes from warm to cold, or from cold to warm, as often as the light and shade changes, and that it is impossible to represent an object of any color by use of different tones of one pigment.

Every change from light to shadow which is easy for you to see means also a change in hue which is not so easy to see, but faithful use of the lenses will discover the rule that if the light side of any object is warm the shadow side will appear cold, and if the light side is cold the shadow side will be warm. It is evident that the strongest effect of local color will not be seen in either the strongest light or the deepest shadow, but between the two, and near the dividing line of light and shade.

It is impossible to produce a vital effect without conforming to this law of contrast between the masses. Understanding the law will aid you to see the changes from warm to cold which appear on objects that are of one unvaried local color.

84. You must use your judgment in your use of the lens to determine the effect of the first painting, for you can not follow the lens exactly if a detail, such as a painted design, comes in either the mass of the light or the shadow. This detail will not

FIG. 27.—From pencil painting by Anna M. Hathaway.

be seen through the lens as design but will change the color and value of the mass in which it comes. An effect of this nature should not be represented in the first painting, for the design must be put in later in its definite form. This can not be done if you have already represented its value in a blurred form over the surface.

85. Then there are accidental effects of complementary colors apparent when the lenses are used too long to study bright colors. These arise in the same way as the purple images in the sky after you have looked at the setting sun, and they should not be represented.

86. Other Aids to Vision.—Two small holes may be made in a card, or the fingers of each hand may form openings to isolate any two values or colors that are not too near each other to be thus compared. The finder, used by artists to study the composition, will also aid in the matter of values and color. Instead of one finder it is better to prepare two of the same size and to cover one side of each with the whitest cardboard, and the other side with the blackest velvet. When your subject is light look at it through the white side, and you will see that there is no white in the effect, for the white cardboard near the eye and in full light almost invariably appears much lighter than any light in the subject. When the subject is dark, look at it through the black velvet side and shade the finder with the hand so that the black in shadow may help you to realize that the darks in the subject are not really black but have much color in them. To use these finders arrange the painting so that it may be seen through one finder while the subject is seen through the other. Use only one eye and look between the finders instead of through them one at a time.

87. Frame Around Subject.—Artists often place a frame about their subject, and sometimes a similar one about the painting. Sometimes the frame around the subject is divided into equal squares by horizontal and vertical threads. If you have followed the directions of Chap. II. carefully you will probably not need the squares to help in drawing. The frames may, however, aid you to see effects and masses in the same way that the lenses do.

Fig. 28 represents a group of still life and a painting of this group when placed beside the group for comparison. You must not conclude that the marked differences between the two are entirely due to mistakes in the painting, for the common photograph often distorts values and color relations even more than it distorts the perspective in Fig. 6. For tests of values and color you must rely upon the use of the lenses, as a photograph will seldom give either light and shade or color values truly.

88. Red, Yellow, and Blue Pigments.—Red, yellow, and blue were once considered the primary colors because from pigments of these colors all the other colors could be obtained by mixture. By mixing colored lights instead of pigments, the true primary

FIG. 28.—From photograph of painting placed on easel beside the subject. A frame encloses the subject.

colors, that can not be obtained by mixing other colors, are found to be orange, green, and violet. But the artist must use pigments, and so the true theory for his assistance in mixing them is the old theory that red, yellow, and blue are the primaries.

Red and Yellow combine to make Orange; Yellow and Blue combine to make Green; Blue and Red combine to make Violet. Orange, Green, and Violet are thus the secondaries by the pigment theory. Orange and Green combine to make Citrine or a yellow gray. Green and Violet produce Olive or a green gray. Violet and Orange produce Russet or a red gray. These grays are called tertiary colors. Red, Blue, and Yellow when mixed to neutralize each other produce the neutral Black.

Black mixed with any primary, secondary, or tertiary darkens the color, and the result is called a Shade. White mixed with any color lightens it, and the result is called a Tint.

Before attempting to paint in oils, water-colors, or pastels, you should make all the above mixtures and repeat them as many times as may be needed to enable you to match any color, or tint, or shade of any color; and to be perfectly sure that the only pigments that the artist needs are red, yellow, and blue, black, and white.

89. Avoid Many Pigments.—The price lists of color makers include hundreds of colors to the confusion of the student who is thus influenced to use too many. The objections to many pigments are that colors often act chemically on each other, and the more colors you use the greater the chance that the picture will become black and colorless in time. Every added color means more time taken in finding it in the box and on the palette, so you should confine yourself to a few pigments which you have tested separately and together to be sure that they are permanent and do not destroy each other.

Test pigments by combining them and by mixing them with white, and placing the results on canvas which is to be exposed to sunlight for months or years.

90. Warm and Cold Colors.—Colors are called warm or cold according to the preponderance of the pigments that compose them. Red and yellow are the warm colors, and any mixture in which these predominate is a warm color. Blue is the cold color, and any mixture in which it is most active is a cold color. Do not try to name each individual color and mixture, but learn to classify all as warm or cold. To aid in doing this hold your palette as far as possible from the eyes, or, better still, place it on a small table as far away as you can reach to mix the warm and cold tones. Do not try to remember the colors that you mix for any effect, but be guided entirely by your use of the lenses. If they show that your sketch is warmer than the subject, you must add more blue. If the lens that reflects the painting is bluer than that which reflects the subject, then add more red and yellow. If the lens that reflects the painting is lighter than that which reflects the subject, then add more red, yellow, and blue, and if it is darker than the lens that reflects the subject, you must add more light colors or more white until the two blurred images on the lenses are exactly alike in warm and cold color and in light and dark.

When you compare your painting with nature be sure you have as strong a light upon it as that upon the group. If you can not get this light without foreshortening the surface of the picture you may place it at any oblique angle that may be needed to make the lights of the painting equal those of the subject.

91. Truth is Difficult.—Nothing is more difficult than truth of color, tone, atmosphere, and drawing; and nothing begins to equal the beauty which this truth gives. The painters who have approached truth are generally the greatest in art. Realize this, and work for truth until you can express it, and then it will be easy for you to paint in a lighter or darker key than nature,

or in a warmer or colder scale of color, and you may also change the composition as you wish.

Avoid crudity of color in the painting that is apparent when the lenses are used. The attempt to reproduce the light and color of nature often results in a crude or chalky painting unless

Fig. 29.—Half-hour brush drawing by first-year student.

you use the lenses often to overcome the effect arising from the use of pigments, as they come from the tube or the pan.

92. Tube Colors are Crude.—Crudity is almost sure to result from the use of pigments as they are found in the tube or the

pan of the color maker. Generally two colors at least must be combined to avoid crudity, and it is better to have a little of each primary pigment in every tone used.

The impressionists avoid this crudity by using pure pigments in such small spots that they blend in the eye when seen from a proper distance, and produce a richness of tone and color that is difficult to obtain by pigments mixed with the brush. This method permits great strength and refinement of color, but it is a slow method and not advisable for the student, who should try to mix colors on the palette so as to cover quickly the entire canvas.

93. Direct Painting Advisable.—When it is possible to produce such results at one painting as those by Sargent or Redfield, their beauty and strength equal or exceed any effects gained by slower methods. If you are able to do your best by one painting you are fortunate indeed. But if you must repaint, remember that there are very few painters who do not do their best work in this way.

Do not repaint, however, by placing one solidly painted sketch on top of the first one, for the colors and the technique of the first will show through the second painting. If the first solid painting is not satisfactory, scrape it off entirely, and repaint upon the clean canvas. If parts are satisfactory, retouch the other parts when they are dry by a thin glaze of transparent color, or by scumbling, or hatching.

94. Toned Pigments.—Some artists prepare and tone their colors for each picture before they begin to paint, and complete formulas have been devised to obtain a toned and harmonious picture.

You should avoid all methods that substitute a formula or rule for visual appearances, but you need not hestitate to tone your colors, or even to prepare toned colors in tubes.

Toned pigments may now be purchased in both oils and water-colors, and, if your color sense is not keen, they will aid you to avoid crude color. If you use toned colors, you will also need pure red, yellow, and blue whenever the subject is light and brilliant or strong in color.

Select the pigments that suit you best, making sure they are permanent, and do not use more than half a dozen on any one sketch. When your subject is light, use light colors, and when the subject is low toned, select darker pigments. Do not adopt without trial the palette of any artist, no matter how noted.

95. Avoid Heaviness.—Never paint any darker than is necessary to produce the desired effect, for all pigments darken or lose color by exposure to light. You can almost see some modern paintings change, so rapidly do they darken in only a few

years of exposure under the best conditions of light and atmosphere. When you paint pictures to be kept, it is better to make them lighter and brighter than nature, for if you do not, time will soon make them so dark that they will lose all truth and beauty.

When copying an old master you should remember that it was far lighter before age, varnish, and dirt reduced its light and color.

96. Impossible to Equal Nature.—When you place your picture in the same light as the subject, you may closely reproduce its colors so that the blurred images of the two lenses will be of the same strength if the colors of the subject are not too dark. When the subject has black or dark objects you can not equal their strength, for there are light and shade on every object, and the shadow side of a black object must be darker than the light side. The shadow side must be represented by black, and a much lighter tone must represent the light side of the object. When you compare the painting with the subject by use of the lenses, the comparison is of black which is in shadow on the object, with black which is in light on the drawing or painting. In this case the best that you can do is to use black for the shadow side and make the values of all the other parts agree with this strongest dark. If you keep these relations simple and true, you can make an effective picture which is much stronger than at first thought seems possible. This is due to the fact that the black object in shadow is often so far away from the eye that, when looked at through the shaded side of the black velvet finder, it appears quite gray.

It is of course impossible to equal sunlight effects or even the brilliancy of glitter lights on polished objects in the studio. True values will, however, result in satisfactory effects if you do not attempt details at the expense of masses.

97. Brushes.—Buy the largest and the smallest brushes made, for both oils and water-colors. Always use the largest brush that will not interfere with the drawing of necessary detail.

For oil-colors, bristle brushes come in many forms. You will determine the best forms by practice. A few small red sable brushes will, however, be needed for fine details.

For water-colors, red sable brushes that come to a sharp fine point are best. Camel's hair and Japanese brushes are cheaper. A short stiff bristle brush may be used to take out water-color that is too dark. A small red sable brush should be provided for fine drawing.

98. Method of Painting.—In any medium strive to produce the tone and effect of the subject as quickly as possible and to cover the canvas or paper right out to all the corners, so that you

FIG. 30.—Brush drawings by first-year students.

may place the brightest light, and the strongest dark, without delay, and test the effect and masses by the use of the two lenses. Before you begin to paint study the effect through one lens, and all the time as you work, use the blurred vision Reynolds described until the masses and effect are true. After this is accomplished you can focus your eyes on the detail needed to finish the picture. It is better to put in too little than too much detail. After it is all represented you should always apply the test of the lenses, to see that the detail does not show any more strongly in the lens that reflects the painting than it does in the lens that blurs the subject.

Avoid the common mistake of insisting on obtaining effects at first touch. A few great artists have done this, but they did not do it when they were students, and you will never do it if you ape the cleverness which the masters gained only after a lifetime of hard work.

99. Art Should Follow Truth.—When able to tell the truth about nature's appearances study the works of all schools and all painters, and feel free to improve on nature if you can do this with a distinct and genuine purpose of your own, and with no thought of copying others' results, or methods. Tell your own story in your own way and win on your own merits. There is no chance of winning by being a copyist.

PAINTING IN CHARCOAL.

100. Charcoal is the easiest medium for the beginner, as it requires little thought except for form and values. Until you can tell the truth about these, it is wise to avoid the more difficult problems involved in subjects that require thought for drawing, values, color, and technique all at the same time. Simple effects in color may, however, be attempted as described in Sections 129 and 130 before you are able to draw.

Aim to represent the light and shade and color values of objects and background so fully that if you were color blind, and should compare the charcoal drawing with the subject by the aid of the lenses, the lights and darks in both lenses would appear exactly alike to the very edges of the paper.

101. Produce the tones by placing a large round stick of the softest charcoal flat on the paper, and passing it over the entire surface as quickly as possible. Rub the tones thus produced lightly into the paper with the hand or a cloth, and then draw the detail and strengthen the tones as needed with the end of a stick of charcoal, which may be hard and sharpened to a fine point if desired. Take out lights with a piece of Art Gum or a

clean stump. Fix the drawing with liquid white shellac diluted with denatured alcohol, until it is about twice as sticky when almost dry on the fingers, as is the fixatif usually prepared by art supply stores.

102. Spray the fixatif on the face of the drawing with a folding tin atomizer, being careful not to get near enough for drops to form and wash the charcoal away. You may paint the fixatif on the back of the drawing after placing the drawing face downward between two sticks upon which the edges may be fastened with tacks. Use a large bristle brush for this purpose.

Make quick sketches on half sheets of charcoal paper, and finished studies on entire sheets.

Always make all drawings and paintings life size or as near this as the paper will permit.

My book "Light and Shade" explains the theories which you will discover for yourself if you use the lenses as directed. Do not study this book until you can make effective sketches in a half-hour, and do not attempt such finished results as those shown in this book until after you can make the half-hour sketch that stands the test of the two lenses.

PAINTING IN WATER-COLOR.

103. You should begin with monochrome, using charcoal gray or cold sepia in tubes. Any cheap white paper will do for quick sketches, but you should use pure cold-pressed linen or water-color paper for finished studies.

Before you begin to paint, study the effect carefully by use of one lens held at such a distance from the subject and your eye that the subject fills the lens. *Look at the lens and not through it,* as if the blurred image were painted on the lens; and memorize the forms and colors so that you could work from memory. Besides studying the effect of the entire group by use of one lens, it is well to move near enough to the group to be able to make each object in the group fill the entire lens, that you may separate the mass of light from the mass of shadow. Any part of any object may be made to fill the lens that its color may be seen. After this careful study of the effect, begin the painting, using the wet method or the dry method as you prefer.

104. The Wet Method.—Thoroughly soak the paper and a piece of blotting-paper of the same size. Place these papers upon a sheet of glass with the blotter next the glass, and hold the papers on the glass by four rubber bands over their edges. A drawing board having oil-cloth under the blotter may take the place of the glass.

FIG. 31.—Drawings by the same freshman. The outline is poor in perspective. The brush drawing made five months later is good in both drawing and values.

Make the drawing with the point of a brush wet enough to take up a little color. Then with the side of the brush lay in the masses of color. Use barely water enough to hold the color and deposit it where it is wanted. Too much water will flow the color outside its proper limits..

Keep the paper always wet enough to enable you to add more color and to take off color with a dry blotter, or dry brush, or a cloth. If the paper dries, spray clear water upon it with an atomizer, and continue to perfect the drawing and the color until a satisfactory effect is gained. When this is done allow the paper to dry as you add the finishing touches of details, since these need to be sharp in outline. This is the Dutch method and is capable of splendid effects that are artistic and strong at the same time. Do not use Chinese white or any body colors on such drawings.

105. The Dry Method.—There are so many different ways of using water-colors on paper that is dry or moistened by a wash of water or of light color that I question whether I should more than advise you to experiment until you find your own way. A few explanations may, however, be helpful if you do not consider them complete or binding, but simply the basis for the practice that will develop your own method.

The early method for water-colors, like that for oils, was to obtain the drawing and light and shade in some neutral color, and then wash the needed color over this foundation, using transparent colors.

The modern artist aims to secure effects as directly as possible, and seldom employs the old method of colorless underpainting.

The best modern water-colors are those in which drawing, light and shade, and color are all given at one painting, and the nearer the modern artist comes to doing this at first touch, the better he is pleased. Keep this fact in your mind, and gradually you will evolve your own method that will be direct and artistic.

Some artists carry a light wash of color over the entire surface of the paper, varying its strength and color as it proceeds, and when this is dry placing other washes over the first until finally the accents of dark are added with a fine pointed brush.

Another method is to place the washes one at a time in their proper places, and allow each to dry as nearly as possible of its desired full strength. This is a crisp direct method but apt to produce lines of light if the washes do not meet, and lines of dark if they overlap. You can improve upon this method by working needed detail into each part before the wash dries, with a moist brush and a little color, and you can leave a tiny space of white paper between different colors as you apply them so they will

not run together, and then, just before these colors are dry, you can blend them slightly with a moist brush, thus avoiding the hardness due to lines of white or lines of dark between the different colors.

If hard lines do come, they can be softened with water and a soft brush, or sponge. A bath of clean water over the entire sketch will help a result that is crude or outlined.

Let the white of the paper produce the high lights, and do not use Chinese white or body color at all unless you use it in all parts of the sketch.

I can not tell you how to represent any object, detail, or effect, for this would mean formulas and recipes in place of observation and truthful representation. Use your lenses until they fail to improve the masses; thus you will find your own way, and do your best work.

PAINTING IN OILS.

106. Materials.—Oil-colors come in tubes that are intended to contain pigments of the right consistency. Color that is too thick may be thinned with equal parts of turpentine and linseed oil. Poppy oil dries slower than linseed oil and may be used to retard the drying of the colors. Siccatif may be used to hasten drying, but it is better for you to use at first simply the colors as they come from the tubes.

The painting may be made upon paper, cardboard, canvas, or wooden panels. The natural surface of all these is very absorbent and most painters prefer to prepare the surface, so that the color will not be absorbed too quickly. This may be done by a coat of varnish, or paint, or of glue size and whiting. Some painters prefer to work upon an absorbent surface which may be prepared by thin glue size and whiting mixed to the right consistency to apply evenly, and in a thin coat when the mixture is cold. This is suitable for panels of cardboard or of wood. An absorbent canvas may be made by tightly stretching the canvas over a stretcher or any other surface, and then giving it a coat of thin glue size. If thick glue is used the canvas will crack. When the canvas is dry a coat of white lead paint thinned with turpentine is applied. The canvas is ready for use when this paint is dry. By mixing the white lead with linseed oil instead of turpentine a non-absorbent canvas is secured, and this paint may be used upon wood or cardboard if desired. When wooden panels are used they should have a coat of paint upon the back to keep them from warping.

The cheapest material for the many quick sketches the student

must make is paper or cardboard of any thickness prepared as explained above. You may make many of your first sketches on the same panel or canvas by scraping off the paint with a palette knife when the sketch is completed and then washing the surface clean with a cloth and kerosene.

107. Use a White Ground.—The old masters painted upon a pure white surface, and you should do the same, avoiding even the natural surface of wood or cardboard, which will darken with age. If you paint upon an old picture its colors will darken those placed upon it, and in the same way any dark ground will strike through. Therefore you should not save your paints by placing them upon the panels or canvas you may have on hand for future use.

Varnish is not white and therefore not suitable as a ground for anything except practice sketches, and even these will be better if made upon a pure white surface which aids you to keep your work light and effective. Another objection to a varnished surface is its smoothness; therefore avoid using varnish except when you must prepare a panel for immediate use, and must therefore use a varnish prepared with alcohol. Whiting sifted upon this varnish before it is dry will improve the surface.

108. Monochrome.—The first work in oil-colors should be in monochrome, using black and white or any dark brown color as raw umber or Vandyke brown. In study of a cast having warm reflected lights a little yellow ocher may be added to these parts.

Try to cover all the canvas as quickly as possible so that you may use the lenses as a test of values and masses, but remember that good drawing and true values are more important than clever technique, and so you should work over your first painting until no mistakes exist in any of these points. If you make a sketch that has fine qualities it may be well to keep it, even if it is not perfect everywhere, and not risk losing the good qualities by repainting; but most of the time it is better to repaint until clever handling gives place to honest drawing and modeling, unless all these qualities can be had at the same time.

109. Painting in Oil-Colors.—Many of the old masters painted with black, white, and red until drawing and modeling was perfected. When this ground was dry, they added the color by thin glazes of transparent colors. Beautiful effects of light and color are possible in this way, but you must not allow the old masters' results to blind you to the beauties of the soft and pearly tones of flesh in a natural light. The light and color in many old pictures are not true to daylight effects unless also influenced by colored or strong reflected lights. You should strive

to represent at first simply what you see by the light of any window,—North, South, East or West. When able to do this, you may study by firelight, or lamplight and daylight combined, or by any artificial colored light.

110. You should mix your colors on your palette to give the right color and value at one touch if possible, but when the lenses reveal mistakes, you should add more color to the sketch until it is corrected or until you have to scrape off all the color and begin again.

111. You can change the colors or the values of a solidly painted picture which is quite dry by glazing transparent colors thinned with medium upon it, or by scumbling thin opaque colors; but this should be the last resort to avoid scraping out and repainting. Do not understand me to mean that you may not secure good results by glazing, scumbling, hatching, and stippling, for many painters do their best work in these ways, and often they are the best painters.

112. The Masters Work Hardest.—Do not think the masters do their work without effort, for often they may have to scrape out all the work of the preceding day and repaint, and continue this process for many weeks before they obtain the satisfactory result which looks as if done without any effort.

113. No Best Way.—There is no best method. One artist of high standing never began to succeed till he painted upon the wrong or unsized side of his canvas. Some artists prefer to work upon an unsized surface which takes up the medium so quickly that the paint must either be made very thin with spirits of turpentine or be applied with a palette knife.

Occasionally an artist may adhere to the old method of covering the canvas with a thin wash of transparent brown darkened in the shadows before painting solidly, but most painters who begin with thin color prefer to use the color visible in nature, since this hastens the effect and aids in the present effort to express the light and pearly color seen by the sensitive eye.

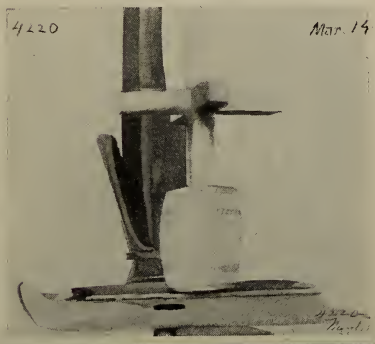
Some painters use a siccatif or drier, and others use slow drying mediums. Varnish and oil and turpentine give a quick drying medium occasionally used. Good results come whenever an artist who sees truly and feels deeply is in earnest about his work. This is the reward you have for the many years of hard work that are necessary before you can do your very best.

114. Avoid Sharp Edges.—Always paint the object and its background at the same time, and finish at one sitting, or at least finish the drawing of the contour of the object. Nature's outlines are seldom sharp, and if you do not paint object and background at one sitting the edges are apt to be too hard.

Drawings by the Same Freshman.

Entrance Examination September.

Brush Drawing March.



Brush Drawing, One Hour April.

All Drawings were Examinations.

FIG. 32.—Gain made in freshman year.

You must vary the sharpness of the edges in all parts of the painting. As in outline drawing there must be no rule or definite plan for doing this, for it is a matter of feeling and artistic expression. In painting this variety is easier to obtain than in outline, for in light and shade or color you can represent exactly what is seen to a greater extent than is possible in an outline drawing. The student should therefore aim to be truthful until it is easy and natural to be so.

Outlines are often lost entirely in the shadows, and care must be taken not to represent these outlines that are not seen. Sometimes the outlines are lost in the big masses of light. The outlines of cast shadows are always changing in sharpness.

In light and shade or color be careful not to draw outlines around objects, for you never see them in nature. Objects appear lighter or darker than what is behind them, and there is never a continuous outline of light or of dark around any object. There is a narrow shadow underneath an object that separates it from the supporting object, but this is part of the shadow and not found outside the shadow.

Generally an object is lighter than the background in one part and darker in another, and so the effect is continually changing from light to dark and from sharp edges to blurred edges. You must observe all these changes and represent them truthfully but without exaggeration, for edges without variety of light and dark and of sharpness and softness are fatal to truthful and artistic painting. Uniformity of edge and forms that are outlined are, however, permissible and necessary in decoration where design and conventional beauty are most important and exactness of visual appearance is to be avoided.

115. Vibration of Color.—The impressionists have greatly extended the painter's power by proving the value of the laws of color contrast in the effort to represent light and color. You should study these laws, and in landscape painting at least, you should experiment with spots of contrasting colors of the same value. This method is especially helpful in representing a blue sky, and in any subject it will give strength and refinement of color. In still life and portrait work students should use blended colors in flat tones that will produce the effect of nature in one lens just as the subject reflects it in the other.

116. Forget the Actual Colors.—You should entirely forget the color of the object and the colors of the pigments you are mixing, and think simply of the warm and cold, the light and dark of the effect, as seen upon the lenses. It will be easier to do this if you always stand as far as possible from your easel. If you are not one of a large class, place your easel a few feet

away from the model, observe the model from a distance, and then walk up to the easel and paint from memory, until you need to observe again.

117. Do not hesitate to add bright and pure pigments to any part of your picture as may be needed to make this part seem in one lens the same color that the subject appears in the other. You can not represent snow with white paint, and you can not at first produce the effect of flesh with the colors you think it ought to appear. Until you rely on the lenses there is little chance of your using the right colors or seeing more than the actual facts of color. Use the lenses properly and always paint with pure color, never using neutral mixtures until the two lenses present the same masses of color. By this means you may save a score of years of colorless results.

118. The Palette.—The best palette is made by placing clear glass upon a sheet of white paper on the top of a small table. The table is valuable not only to save you the labor of holding the palette but to support it farther from the eye than it can be held by the hand. This distance helps you to think of the color you are mixing rather than of the separate pigments in it.

119. You should always arrange the colors in the same way on the palette but should try to avoid formulas for mixing tones and depend instead upon the effect of the mixture as warm or cold and light or dark. You can match values and colors in this way much more quickly than by the use of formulas.

At the end of each sitting clean your brushes, first in kerosene and then with soap and warm water.

120. The oil-colors put up for house painters' use in pound cans are cheaper than tube colors and good enough for many purposes when made by a reliable maker, and of an earthy nature. You can test these colors as explained in Section 89. French zinc white in pound cans is also satisfactory and half as expensive as the color in tubes.

PAINTING IN PASTELS.

121. Pastels are made of color that is bound together in the form of a crayon by gum tragacanth. Each crayon makes its colored mark just as the white chalk crayon makes its mark. It is evident that pastels can not be used on a smooth surface.

You can make your own pastels readily and cheaply by following directions given in the book "Letters to a Painter" by Ostwald, translated by Morse.

122. Special pastel cardboard and canvas with a fine sanded surface is made, but any paper with a rough surface will answer.

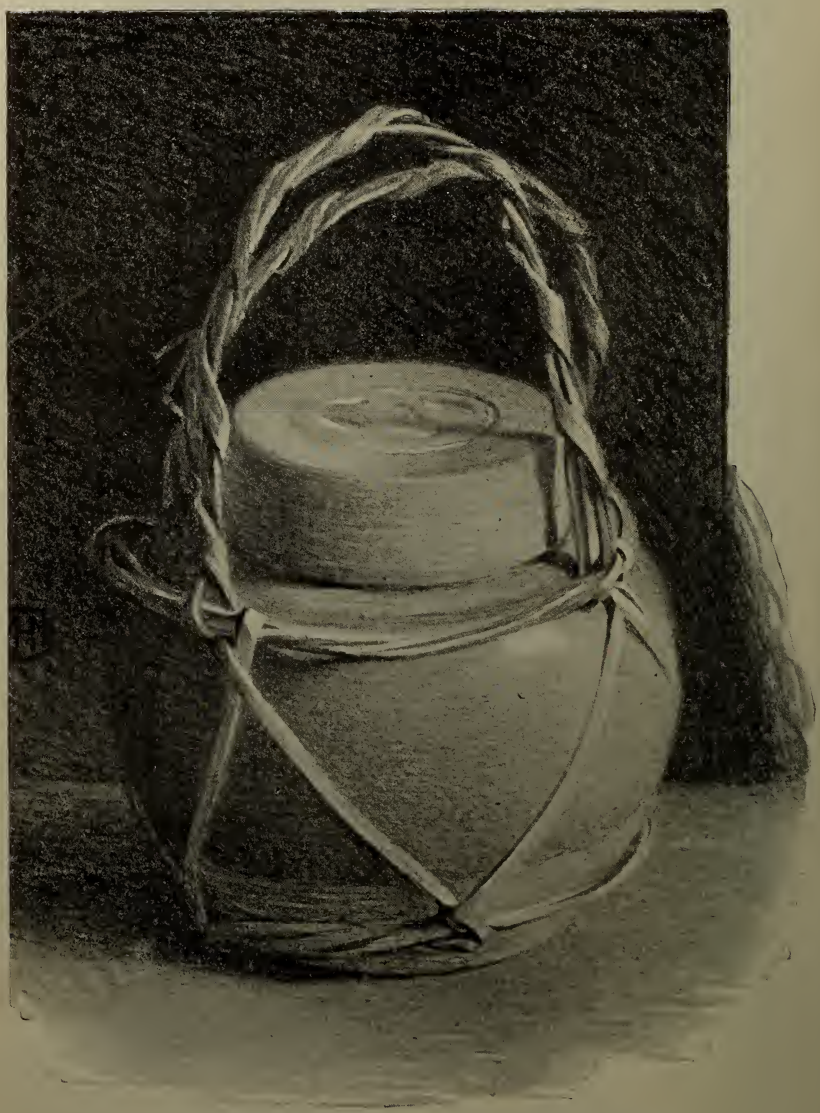


Fig. 33.—From pencil painting by Anna M. Hathaway.

A sheet of tinted crayon paper makes a cheap substitute for the special papers, while oatmeal paper such as paper-hangers use is cheaper still, and good enough for quick sketches.

With pastels as with other mediums it is simply a matter of getting the right color in the right place, but as pastels are not as easy to mix as other colors, you may have a more extended list of colors.

123. Pastels may be blended to produce any desired color by rubbing two or more crayons over the spot where this color is needed, and then blending the different colors together with the hand. This result may be obtained by the impressionist's method of separate strokes of the different colors placed beside each other or one upon the other.

Pastels are permanent when made of pure and permanent pigments, but the color is easily rubbed or shaken from the picture, and should be protected under glass, or by fixing with a special fixatif for pastels.

In some ways pastels are easier than other colors for the beginner. I have seen beginners produce really excellent results in the first attempt with pastels (see Frontispiece). The chief objection is that they are dirty, and the floor under your easel must be covered with a cloth. It may be wise for you to experiment with all the colored mediums, and then continue with pastels, oils, or water-colors as you prefer.

124. Hundreds of tints, shades, and tones of colors are prepared for you to select from. I would advise you to purchase the large soft crayons ½ inch in diameter and 2½ inches long. Buy the primary, secondary, and tertiary colors, with black, white, and light and dark grays, both warm and cold. This will give you fifteen crayons, and you may add tints and shades and hues of the above colors if you find that you need them, but the fewer you require the better.

125. Before using the colors make a few sketches in black and white, with an intermediate neutral gray, to learn how to blend the tones. Obtain the masses by placing a crayon flat on the paper. Draw detail with the end of the crayon, which may be sharpened if desired.

126. As with oils and water-colors you should use bright pigments when the subject is light, and lower toned colors when the subject is darker. Do not use neutral browns and grays in any medium, but make all colors by mixing the primaries or secondaries without fully neutralizing the result. You had better err on the side of a little too much color than avoid crudity by commonplace browns and neutral grays.

Do not fear to believe your eyes and represent what you see

by the use of the lenses. Many artists have seen truly but have been afraid to paint what they saw until some braver soul had done the work and gained the reward of independence.

127. Choice of Subject.—Though the medium you use is not important, it is important that your first subjects should be selected so as to make it easy for you to study the point in which you are most deficient. If you can not draw, you should work in outline from boxes, furniture, and geometric forms, in-doors and out-doors. If you wish to study light and shade, select still life in which the objects are not too broken in color. Objects of one color are best, for all the changes are due to light and shade. In the same way, such still life subjects are the best for first lessons in painting. Avoid all objects that are covered with designs and those whose forms are complex. Fruits, vegetables, and still life are the best subjects for the beginner in color. When you are able to paint these well you will have little difficulty with the figure or a landscape.

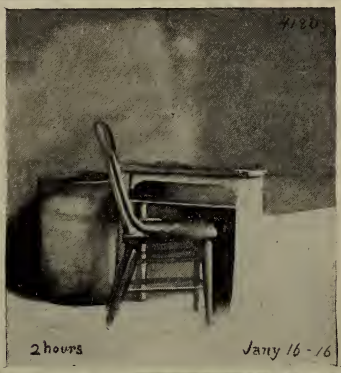
128. You should select still life that you can represent full size. If you work in your own home you should place the sketch beside the group and keep it there most of the time that you spend on the drawing. At least, you should keep it beside the group until the lenses prove you have the values and masses correct. You should observe the appearance from the desired distance, walk up to the drawing and work upon it until you have done all that you remember. Then you should observe again, and so continue until the drawing is complete except possibly for a few finishing touches. These you may make if you wish, with the drawing placed so that you can work and observe at the same time.

129. First Painting Lesson.—The best subject for study in values or color is a background and foreground when both are covered with paper or cloth of one flat color. In a painting the background is as necessary as the objects, and this subject that involves no drawing will quickly prove how much the color and value of any material are changed by the light that falls upon it. At first glance you may see no difference between the color or value of foreground and background, but when you hold one lens so that it reflects the color of the background and the other so that it reflects the color of the foreground, it is seldom that you will not see a marked difference. You should try this problem from many different colors and materials until it is easy for you to see these relations truly. Then you should arrange drapery in folds over background and foreground, and make careful paintings of both form, light and shade, and color effects.

Drawings by the Same Freshman.

Entrance Examination September.

Brush Drawing, Two Hours March.



Brush Drawing, One Hour and a Quarter April.

All Drawings were Examinations.

FIG. 34.—Gain made in freshman year.

130. Next place any colored object upon a background and foreground without folds, and try to decide whether the light or the shadow of the cloth is the warmer; and whether the light side of the object is warmer or colder than the shadow side. Study these relations by use of the lenses and then paint the effects until the lenses prove that you see truly.

When able to determine light and dark, and warm and cold colors for one object and its background, begin to study groups, always using the lenses before painting and during painting, and for a final criticism of the completed sketch.

131. When you can represent the group, you will readily include that part of the room about the group. When able to represent this subject you will not hesitate to try a landscape or street scene. These latter are no more difficult than the interior, and there is no reason why you should not study them before the interior if you wish to.

132. You can try a portrait whenever you desire. Without regard to the subject, all that you need to do is to reproduce the colors and masses you see upon the lenses, and then add the most important details visible without the use of the lenses.

133. The Palette.—I have not specified the pigments to use, because this would do more harm than good. I do not wish you to copy any one or accept any person's judgment without trial. It is a simple matter to experiment with the colors that are said to be permanent or nearly so, and thus decide your own palette. Much depends on whether the colors are mixed too much or with too many other colors. Permanent colors may be spoiled by other colors, and colors not considered permanent may prove satisfactory if they are used quite directly and not retouched.

134. Your selection of colors will be influenced by your eye for color, and if it is sensitive you will be able to use pigments that would produce crude effects in the hands of one whose color sense is not keen.

It is wise for you to begin with subjects that can be represented by low toned pigments of an earthy nature and gradually as their need is felt add the brighter ones.

Try to remember that the stronger the artist the fewer the pigments he uses, and some noted painters have placed only three pigments with black and white on their palettes.

135. Choice of Medium.—Broadly, this becomes a question of whether drawing or painting is the aim of the student. Of course, you must draw when you paint, but it is easier to draw with a firm and hard point than it is with the yielding point of a brush. Therefore the old masters when they wanted an exact

drawing, used the point of a pencil, or a crayon, or even a pencil made of pure silver. With such a sharp instrument you may study the most minute changes in form. You should use such a point for exact studies until you can draw quickly and perfectly all the detail in a difficult subject, but you should not study values or color effects with such a point unless the drawing be very small.

136. When you wish to work in values you should use charcoal or water-color monochrome, and avoid pen and ink and all pencils or crayons.

In color study use pastels, water-colors or oils, as you prefer.

The methods of this book enable you to study color and values while you are learning to draw. You will be wise to spend your time first on drawing and then on painting, and to keep shifting from one to the other as often as you meet with success in one and failure in the other.

137. You should draw with the brush as well as the pencil when you find you can draw correctly with the pencil, and you should experiment with all the different mediums in common use, including pen and ink and etching when you are able to draw without tests and measures.

It should be your first aim to see outline correctly, and then color correctly, and to practice with the different mediums until you no more have to think laboriously of drawing, light and shade, or color, as you work, than the pianist has to put labored thought on his notes or his technique as he enthuses his audience.

138. Draw With the Brush.—It is a great mistake to make a finished drawing as a basis for a painting to be made upon the drawing. With such a drawing comes the fear that you will lose it when you paint. To do the best brush work you must be free from all fear. The fear of losing a drawing will produce a hard and mechanical result, and generally a faulty one as well.

In water-color work a preliminary drawing will show through transparent colors placed upon it, but even then careful drawing of details in pencil will lessen the charm that comes from drawing and painting at the same time with one touch of the brush.

Oil-colors or opaque water-colors hide the drawing completely, and so it is wiser not to put much detail in any drawing made as a basis for a painting. No matter how hard you try not to lose the first drawing, you will do this unless you can draw and do draw all the time with the brush. It is not only a waste of time but an injury to the painting to do more than draw the most important masses before you begin to paint.

Many painters draw with color only, but unless you draw perfectly with the brush and compose with equal facility, it is

wise for you to make a light pencil or charcoal sketch of action and proportion, in order that you may obtain the best composition.

139. If you can not draw and paint at the same time, you should study drawing alone with the pencil as explained in Chapter II. Artists make many sketches and studies for their pictures in which the detail is often most carefully drawn. When the artist produces the final result after having made a series of such sketches, he is sure of what he wants to do, and often is able to draw and color perfectly at first touch.

140. Expect Poor Sketches.—Do not be discouraged when the day's work seems thrown away, for this is not the case no matter how bad the sketch may be. Work that varies from day to day should encourage rather than discourage. The best painters may work for weeks on the same portrait and fail all this time, and then finally produce a masterpiece in one sitting. If your work is not uneven in this way there is cause for questioning whether it is wise to continue, for the best artists do their best work at intervals and generally freely admit it. But they do not cease trying and wait for the inspiration, and you must follow their example. Work that will take first rank will never come until you can do good work even if you are not in the mood for the best.

You must work hard daily to perfect your vision and your technique, for though the artistic beginner may do better than he knows, he must never expect to do the best he is capable of doing until he knows enough to redeem a bad start, and turn it into a good result from his sure and exact knowledge that is more science than the inspiration of art. In other words, the greatest genius prepares himself by the hardest possible training, extending over the whole of his life, for the inspired moments that produce his masterpieces.

141. General Principles.—No rules for painting can be given except that objects are seen through contrasts of simple masses of light and of dark. The light masses are composed of surfaces which receive direct light, and the dark surfaces are those which are in shadow and visible only by reflected light.

In any subject there will be one light which is lighter than all others, and one dark which is darker than all other darks. These must be represented in every painting and kept in these relations.

The nearest of several equally light objects will appear the lightest, and of several equally dark objects the nearest will appear the darkest. Thus a light surface appears to darken as it retreats, and a dark surface appears to lighten. This effect is increased by contrast when the light and shadow sides of an object are juxtaposed.

Surfaces toward the light lose much of their detail in the mass of light. Those in the shadow lose much detail also. Thus a small detail of dark in the mass of light is not a strong dark, and a reflected light in the mass of shadow is not light but a dark that does not break up the mass of shadow.

In painting the drawing is best gained by studying the forms of the shadows and cast shadows instead of the outlines, therefore it is important to draw very carefully the line that separates the mass of shadow from the mass of light.

Cast shadows sharpen in outline and grow darker the nearer they come to the parts that produce them.

The glitter light on any object changes its position as the spectator moves. It is not the fixed point nearest the source of the light, as is often claimed.

PIGMENTS.

		Lead or Zinc White.* Ivory *or Blue Black.
Red	1	Light Red,* Venetian Red,* Indian Red.*
	2	Alizarine Crimson, Harrison's Red, Vermilion.
	3	Lacque Rose Doré, Pink Madder, Madder Lake.
Orange	1	Chrome Yellow Orange.
	2	Orange Vermilion.
	3	Cadmium Yellow Orange.
Yellow	1	Yellow Ocher,* Raw Sienna,* Chrome Yellow.
	2	Chrome Yellow Light, Zinc Yellow. (Inexpensive.)
	3	Aureolin, Lemon Yellow, Cadmium Yellow, Mars Yellow.
Green	1	Permanent Green Dark.
	2	Emerald Green. (Inexpensive.)
	3	Cobalt Green, Vert Emeraude.
Blue	1	New Blue, Permanent Blue.
	3	Cobalt Blue,* Cerulean Blue, French Ultramarine.
Brown	1	Burnt Sienna,* 3 Brown Madder.

The cheapest and darker colors are listed under 1. The lighter (usually more expensive) colors under 2. The most expensive under 3. Starred colors may be purchased in pound cans for house-painters' use.

Do not mix Cadmium or Vermilion with Emerald Green.

Chapter IV.

MEMORY DRAWING.

142. Artists Draw from Memory.—Far more important than ability to draw what is before the eye is the trained memory that enables one to draw without a model to observe. "The Training of the Memory in Art" by L. De Boisbaudran, written in 1847, and translated by Luard, is an interesting book that proves how carefully finished pictures may be made from memory.

The most noted artists have always worked from memory, and some assert that this is the only way the best in art can be produced; so you should realize that the power to draw from the model is only a part of your education. The following from Whistler's Ten O'Clock makes this clear.

143. "Nature contains the elements in color and form of all pictures, as the keyboard contains the notes of all music.

"But the artist is born to pick and choose and group with science these elements that the result may be beautiful. . . .

"To say to the painter that nature is to be taken as she is, is to say to the player that he may sit on the piano.

"That nature is always right is an assertion artistically as untrue as it is one whose truth is universally taken for granted. Nature is very rarely right, to such an extent even that it might almost be said that nature is usually wrong: that is to say the condition of things that shall bring about the perfection of harmony worthy a picture is rare and not common at all."

144. Corrections Necessary.—Memory results that are not corrected train the memory for geometric facts, and aid in design and composition but do not give the visual power the artist needs, therefore you should make corrections easy by making your first memory drawings on the Glass.

You may draw an object from memory after you have first drawn it from observation, or you may study the appearance until you can reproduce it clearly mentally with the eyes closed, and then you may make the drawing without further observation of the object. Either of these ways will give you the power you need, provided you test the memory drawing carefully to discover wherein it departs from the exact truth. Either way of making a memory drawing may be used as you prefer, or you may use both methods alternately.

145. To draw from memory observe any object carefully enough to notice all its proportions and angles, also the background spaces, and fix them in the mind so strongly that a clear mental image of the appearance may be secured when the eyes are closed. Then turn your back to the object and make the drawing entirely from memory. Instead of turning around you may hide the object behind any larger object or you may remove the object after having first drawn chalk lines around it or placed thumb tacks at its corners. When the memory sketch is as perfect as possible, test it after turning to face the object or by uncovering or replacing the object that the drawing on the Glass may be held to appear to cover the object.

146. Memory drawing is at present an important feature of most public school courses in drawing. From the fourth grade up pupils are asked to draw from memory such subjects as children playing games out-doors, or people around a table, or about an automobile or the entrance to a building. Such work may be more interesting than boxes and other objects that make the study of fundamental principles possible, but it is a mistake to allow such figure compositions to take the place of the object drawings that are possible of correction. Ingres said: "Before allowing a pupil to draw from memory she should previously have made a drawing mathematically correct, otherwise by repeating her faults they are engraved on the memory."

I would not prevent children from making free illustrative drawings, for this work has much value; but it is wrong to give it at the expense of that study from nature and objects that alone can develop truthful vision and expression.

147. Cardboard Models.—Geometric forms are the best subjects for memory drawings for the beginner, because it is easy to define their position exactly, and because any mistakes are seen the instant the drawing on the Glass is held up before the object.

The first models should have only two dimensions, and you may cut them from cardboard as follows: An equilateral triangular card, edges 18″ long. A square whose sides are 18″. A regular pentagon, and a regular hexagon, sides 10″ long. If you have not large cardboard, smaller models will answer, and any objects at hand may be used after you have drawn these simple forms.

148. Memory Without Observation.—As the power to draw from memory is more valuable than that of drawing from the model, so the power to draw from memory without any previous observation of the model in the required position is still more important, and is the foundation for the best success as an il-

Fig. 35.—From pencil drawing by Anna M. Hathaway.

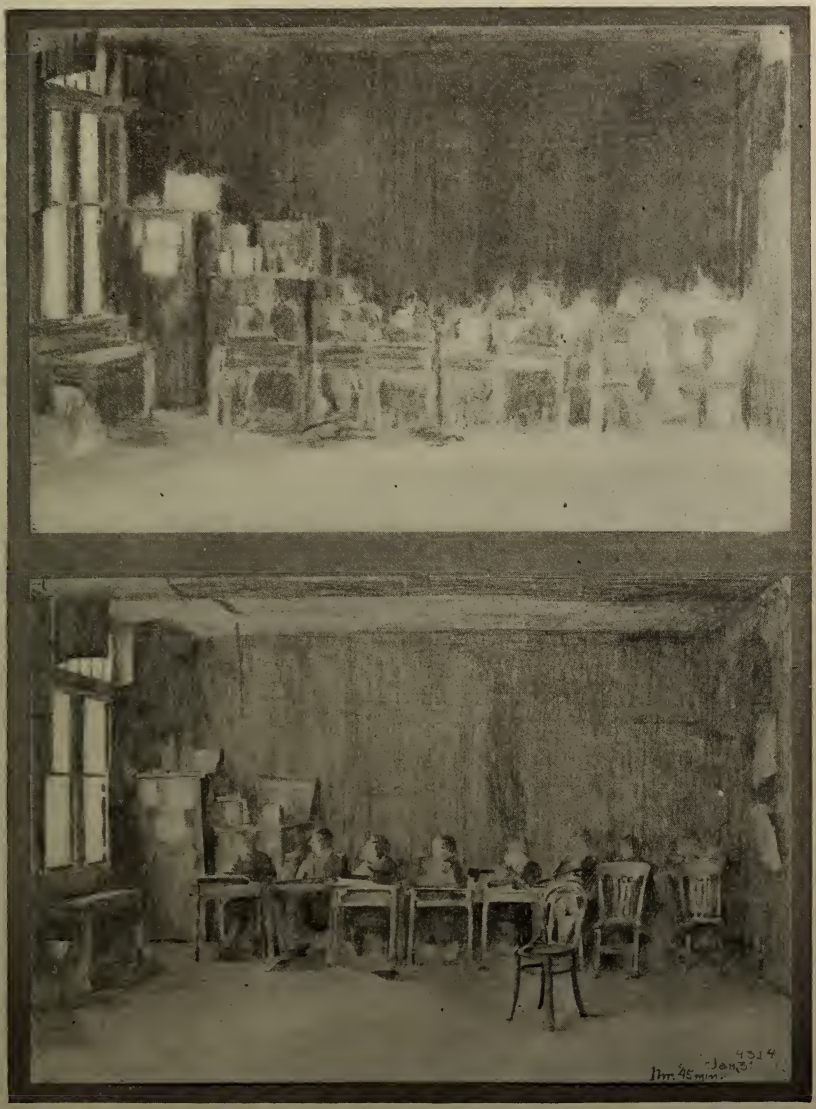


FIG. 36.—Two-hour examinations made after four months' study by two of the students whose entrance drawings are reproduced in Chapter VI.

lustrator or a painter. After you have gained the power to observe any geometric or other form closely enough to draw the form from memory, you should try to draw the object in some imagined position at a new level or new angle. This may be at a given level or angle determined by a slender stick of the length of any edge which is placed at the described level and angle. Observe this stick and draw it from observation, then represent the object extending from this given edge. When the sketch is complete, place the object in position with the described edge coinciding with the stick, and then test the memory sketch on the Glass.

149. The following problems are suggestions for such memory exercises, and you should repeat and extend these problems until you can thus draw any object in any described position.

In each and every problem be sure to draw from memory and not from observation of the appearance you are to draw. When the drawing on the Glass is complete, test it as already explained.

MEMORY EXERCISES.

(1.) Place a stick 18″ long on the floor and draw a square one side of which coincides with this stick.

(2.) Mark off the length of either side of a small rug on a slender stick and place the stick in any position on the floor. Draw the rug as it will appear when one edge coincides with the stick.

(3.) The same as (1) except that the square is to be vertical with its lower edge coinciding with the stick.

(4.) The same as (1) except that you are to represent a triangular card when one edge coincides with the stick.

(5.) The same as (4) except that the triangle is to be vertical.

(6.) The same as (1) and (5) except that the card is the regular pentagon and the stick is 10″ long.

(7.) The same as (1) and (5) except using the regular hexagonal card as model and a stick 10″ long.

(8.) Cut a slender stick to the length of one edge of any box or other object in the room. Place the stick anywhere on the floor and then draw the object as it will appear when the chosen edge coincides with the stick.

(9.) The same as (1) except that the card is inclined at an angle of 45° with the floor.

(10.) The same as (4) except that the card is at an angle of 45° with the floor.

(11.) The same as (1) except that the card is pentagonal and is at 45° to the floor.

(12.) The same as (1) except that the card is hexagonal and is at 45° with the floor. The stick in (11) and (12) is to be 10″ long.

(13.) Cut from builders' pulp board, or better still from 3-ply paneling two circular disks 12″ in diameter and screw them at their centers to a stick 1¼″ square and 23¾″ long. Cut another stick 23″ long and place it anywhere on the floor. Then draw this model of the wheels as it will appear when the axle that connects the disks is exactly over the stick on the floor.

Repeat this exercise with the stick at other angles on the floor, and then at different levels and angles above the eye.

(14.) Cut a stick to fit between the two front legs of any chair, and then draw the chair as it will appear when the positions of the front legs are indicated by the ends of the stick, which you have placed in any position on the floor. When making this drawing be sure the chair is not placed at the angle of the stick, so that you can draw from the object's appearance instead of from memory.

(15.) Place a large cube or box on the floor, and then draw it as it will appear after it has been lifted straight up in the air until its lower surface is on the level of the eye.

Repeat this exercise, representing the object as it will appear when its lower surface is 2 feet above the eye.

(16.) The same as (14) but the stick that locates the chair is to be placed on some table or other surface that is above the eye.

(17.) Place the box of (15) on the floor and then draw it as it will appear after it has been revolved about one of its corners on the floor, through an angle of 15°. Cut an angle of 15° from cardboard, so the object may be turned exactly 15° after the drawing on the Glass is completed.

(18.) The same as (17) but revolve the box 15° more in the same direction.

(19.) The same as (18) but revolve the object 15° more.

(20.) Repeat the exercises of (17), (18) and (19), but revolve the box 30° or 45° instead of 15°.

(21.) The same as (17) but use a chair as model, and continue to draw the chair in imagined positions as described in (18), (19), and (20).

(22.) Make many drawings of the disks of (13) in all possible positions until you have proven that the long axis of the ellipse always appears at right angles to the axis of the object on which the circle is situated. See Fig. 39.

(23.) Procure a plaster cast of a skull, and draw it from memory at many different levels and angles.

FIG. 37.—From drawing by Leonardo da Vinci (1452–1519).

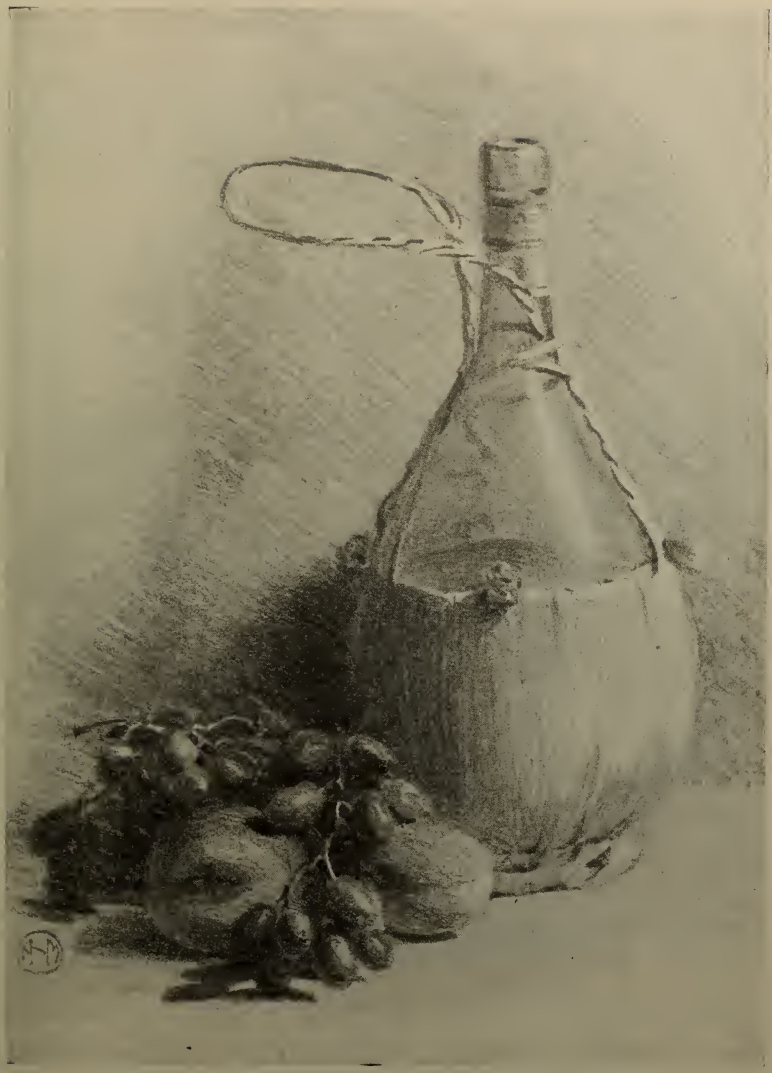


Fig. 38.—From pencil drawing by Anna M. Hathaway.

(24.) The same as (23), using a plaster cast of any antique or modern head.

Many interesting exercises are explained in the book mentioned in Section 142, and it will be easy for you to develop your power of drawing from memory rapidly, as the problems given above not only train the memory but the reason, and make the laws of perspective the artist needs so simple that they may often be understood without study of Chapter V.

150. When able to draw geometric forms from memory or even before this time, you may draw any other object from memory, and especially should you draw human and animal forms from memory. You may practice first from the casts in museums and afterwards from subjects seen in your daily travels.

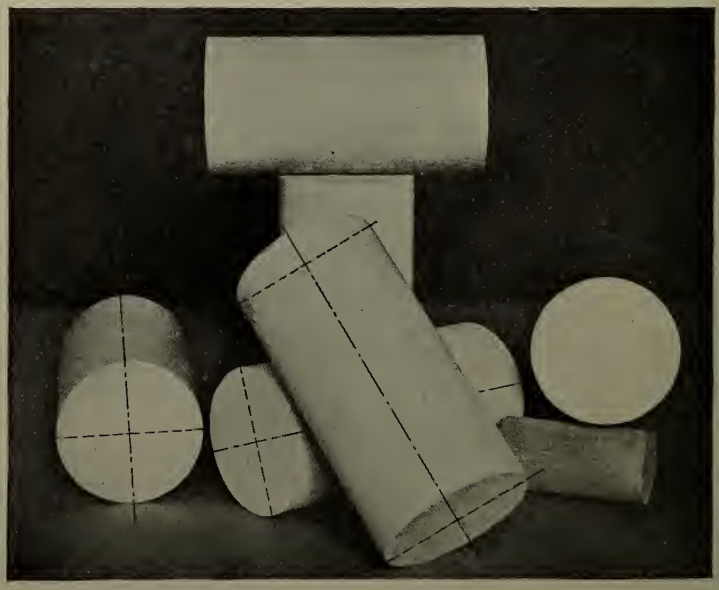


FIG. 39.—From photograph of cylinders.

Chapter V.

PERSPECTIVE THEORY.

151. Perspective.—The art of representing appearances on any surface that may be supposed to be situated between the eye and the objects. The simplest way to make a perspective is to trace upon a window what may be seen when the eye is at a fixed sight placed far enough in front of the window to permit the hand to draw upon the window. In a true perspective thus made every line on the glass will cover the edge it represents when the eye is at the sight (station-point).

152. Scientific Perspective.—A drawing made by the science which enables the angle of every line of the perspective made by tracing to be determined by its vanishing-point, and its length to be measured by its measuring-point, so that an exact result may be determined by theory on paper without tracing or reference to models.

153. Free-hand Perspective.—The artist objects to the distortions of perspective which change proportions and angles as in Fig. 6, but when he draws exactly what he sees he finds that straight lines in nature appear curved in his picture. Therefore he combines the best features of the sketch he makes by eye and the drawing made by theory, and calls the result a Free-hand Perspective. It is true to the proportions seen, and since it represents parallel lines by straight lines that converge to one point, it is as true in representing the facts of form and their relations as is the scientific perspective that is false in proportions.

154. Vision Before Theory.—Follow Ruskin's advice and avoid all theory until you can draw well by eye alone, and do not think that theory will wisely do away with the labor involved in drawing from nature.

Theory is necessary when nature can not be studied, but its results are not as desirable as those due to vision, because the more exact they are as theory the more they differ from what the eye sees. Even if you can save time by using theory it will pay to work longer and travel far to gain the inspiration of nature and her visual proportions which a plane perspective never gives.

155. Theory Aids Vision.—Theory aids both vision and quick results, more when it is unconsciously applied than when

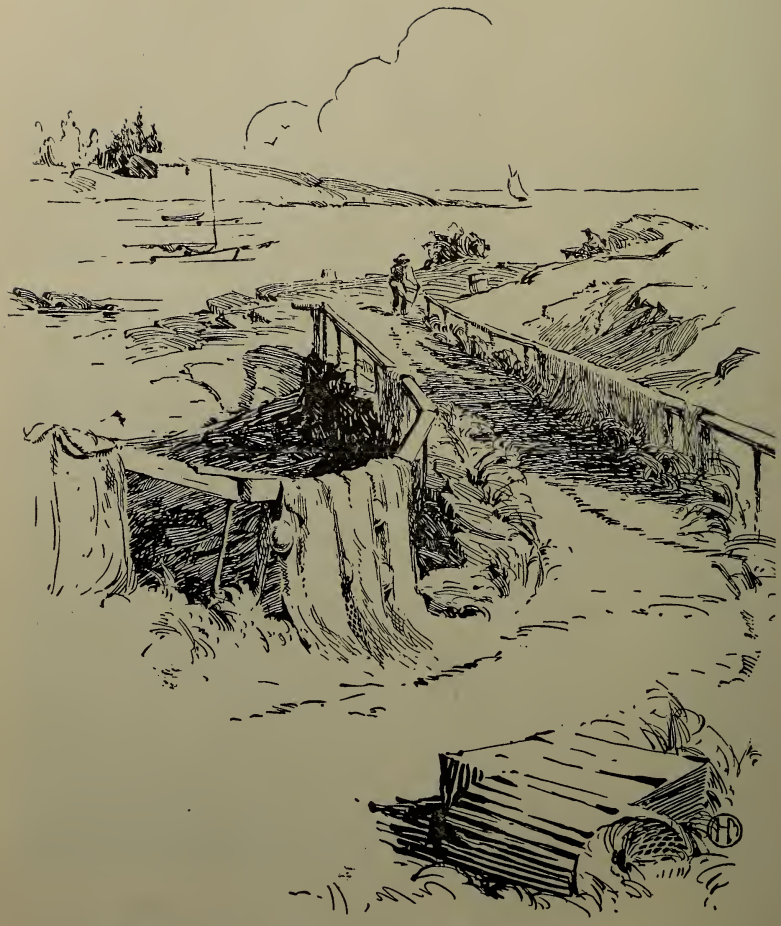


Fig. 40.—From pen and ink drawing by Anna M. Hathaway.

Fig. 41.—From pencil sketch by Anna M. Hathaway.

its vanishing and measuring points are used, for the exact science never has the charm of work done by relying on the eye for angles and proportions. Science lacks this charm not only because it distorts but because nature vibrates and the air causes even the most sharp and rigid edges in nature to appear to tremble and waver so much that a sharp even line in any free-hand drawing is not as satisfactory or artistic as one that gives the impression of straightness without mechanical exactness.

156. Free-hand Perspective Before Scientific.—The artist is most interested in the theory that relates to what he really sees. This is the picture given on a plane that is at right angles to the direction in which he sees an object. This perspective is very different from the distortions of scientific plane perspective. It is called Free-hand Perspective or Model Drawing.

Not only is free-hand perspective better for the artist, illustrator, and decorator, but for all general illustrations. Architects often use it very largely in making their perspectives.

If your aim is simply to be able to draw and paint from nature, it will not be necessary to master the full science, which is as difficult to many as other branches of geometry. The theory the artist needs is so simple that a few hours' study with the aid of the Drawing Glass will make it clear.

157. Picture-Plane (PP.).—This is the surface on which the drawing is made whether glass, paper, or canvas. A true picture or what the eye really sees is one which, if on glass or transferred to glass, will exactly cover or hide from the eye all the edges of the object which it represents, when it is held between the eye and the object in a direction perpendicular to the line of sight.

Picture-Line (PL.).—The line in which the picture-plane rests on the ground. It is sometimes called ground-line (GL.).

158. Station-Point (SP.).—The position of the eye that sees the subject and represents it on the picture-plane by tracing, or by observation, or by theory.

When the eye is at the SP., the lines of any exact perspective cause the same image in the eye that those of the object behind the picture-plane produce. The distortions of perspective are not apparent then, and even the ellipses in Fig. 6 look as round as the spheres. The SP. for Fig. 6 is about two inches in front of the central sphere, hence the distortion is most unpleasant. But if the picture is viewed from a small hole cut in a card and held two inches in front of the middle sphere the ellipses will appear circles.

Every drawing and painting has its station-point from which it looks best. At a greater or less distance there is visible more

or less of the discrepancy between the drawing and the true appearance that is evident in Fig. 6.

159. Horizon-Line (HL.).—This is often supposed to represent the horizon of the ocean, but it does not do this, for the earth is curved, and we look downward to see the line in which ocean and sky seem to meet. The horizon in perspective represents the line in which the ocean and sky would appear to meet if the earth's surface were flat. The horizon in perspective is the line in which the floor and ceiling will appear to meet if they could be continued far enough. This line is on the exact level of the eye, and a little above the horizon of the ocean. This you can prove from the top of any high level wall or building near the ocean, for its horizontal lines will appear to converge toward a point that is noticeably above the horizon. By looking through an engineer's transit when it is perfectly leveled, you will find that the line that separates the sky and water appears below the horizontal sight line of the transit. The higher the transit is placed above the water the lower the horizon will come below the center of the transit.

160. Center of Vision (C.V.).—The point where parallel horizontal lines that run directly away from the eye appear to meet or vanish is called the center of vision. It is always on the level of the eye and exactly opposite the eye.

Vanishing-Point (VP.).—The point at which any system of parallel retreating lines appears to vanish. It is in the horizon for horizontal lines, and above or below the horizon for oblique lines. It is seen by looking in the direction of the parallel lines, and in a perspective diagram is found by drawing a line from SP. parallel to the given system to intersect the picture-plane.

Measuring-Point (MP.).—This is the VP. for a line that will transfer any distance from the picture-plane where it may be measured to scale, to a line that vanishes and on which the distance will appear less than its scale dimension. MPts. are used in the scientific theory not explained in this book since the artist seldom needs this theory.

Distance-Point (DP.).—This is the MP. for C.V. There are two DPts. equally distant at right and left from C.V. Their use will be explained.

161. Perspective Self-Taught.—Fig. 42 represents a student testing a drawing on the Glass made from a skeleton cube. The sides of this model were 4 feet long. Two opposite faces were divided into sixteen squares by horizontal and vertical threads one foot apart. This model makes the theory so easy that all students who study from it understand the theory. You should provide

such a model for your own use. One 2 feet square will be large enough for individual use.

Obtain two perfect squares sawn from three-ply paneling ½ inch thick. Fasten these squares at each corner to sticks ⅞ inches square and long enough to make the outside height 24 inches. You may use brads or screws at each corner, also angle

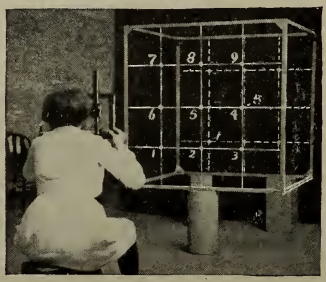


Fig. 42.—From photograph.

irons. Be sure the ends of the four corner sticks are cut perfectly square. When fastened together obtain the sixteen equal squares by threads stretched around the model and held in cuts made with a sharp knife or chisel just six inches apart. Make these cuts in all the edges of the opposite square disks, and also in the outer edges of the four sticks that connect the disks. Use small tacks to hold the threads in place, and to transfer the thread from one level to another. Fine wire will be better than thread for a permanent model.

Fig. 42 shows small circular pieces of paper which are fastened at the intersections of the threads on two opposite sides of the model. These serve as sights to enable you to place your eye opposite any given point. Number these sights from 1 to 9, placing the same number on the opposite points.

A substitute for this model may be made from any large wooden case by tacking sights on the inner surface of the bottom, and threads to the outer edges of the case so they will cross each other exactly opposite the sights that are tacked on the bottom.

Before drawing from this model you must make an adjustable eyepiece or sight through which you may view the object from one fixed point. Nail a strip of pine or white wood 6 feet long and ⅞ inch square to a base large enough to hold the rod upright. Then cut a hole an inch or two in diameter in a piece of cardboard and fasten the card to the rod with thumb tacks. To do this

place the model on a table or other support that will make it easy for you to hold your eye on the level of the center of the model, and then fasten the card to the upright rod so that the card touches the front of the model, and the central sight 5 of the model is exactly at the center of the opening cut in the card. When thus adjusted place the rod about five feet in front of the

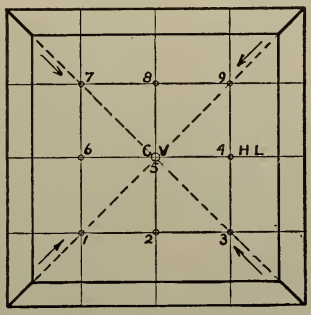


Fig. 43.

model and with the eyepiece directly in front of point 5 of the model so that nearer point 5 covers the farther 5. When thus adjusted study the appearance of the model through the card until you can draw it from memory. Test this memory sketch by holding the Glass vertical and parallel with the model. When you secure a drawing which exactly covers the model viewed from the cardboard sight, continue the lines of the drawing which represent the four edges of the model that run from front to back. You will find that these lines meet at point 5. This is the point on the model that is exactly opposite your eye, and so this drawing shows that the retreating lines of the object vanish at the point that is opposite your eye.

When sure about this, transfer the drawing on the Glass to paper by use of a T square and triangles, to any scale that will make the drawing 2 or 3 inches square. See Fig. 43.

Now repeat this lesson, placing the cardboard sight twice as far from the model as it was for the first drawing. When the second drawing covers the model perfectly you will find that the square that represents the farther side of the model is larger in proportion to the nearer square than it was in the first drawing. The greater the distance of the eye from the model the less difference there will be in the sizes of the squares, and the nearer the eye to the model the greater the difference in the squares.

When the distance of the eye from the model is known, there is a way to measure the length of the retreating side which will be explained later. In transferring this second drawing to paper to the same scale as the first one, you may simply make it look like the drawing on the Glass just as you determined the first drawing on paper.

162. Avoid SP. Near a Large Subject.—Fig. 6 shows the distortion inevitable when the visual angles are large. Your eye must be two or three times the height of your subject away from it to avoid unpleasant perspective. Often artists paint when too near their subject. The queer perspective resulting

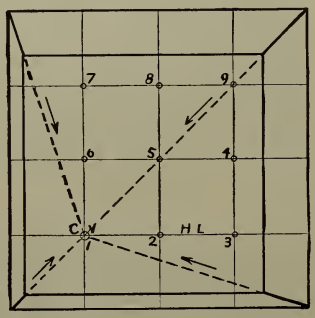


Fig. 44.

will, however, seem true when you view the picture from the same short distance of the painter's station-point. As distance is needed to appreciate tone, color, and effect, it is important to select a station-point that is not too near the subject.

163. The VP. Moves With the Eye.—Now place the sight exactly opposite points 1 of the model and memorize this appearance. When the drawing on the Glass covers the object perfectly, continue the lines that represent the retreating edges, and they will meet at point 1, and thus illustrate how the VP. (C.V.) moves as the eye moves, always being on the eye level and exactly opposite the eye. Repeat this drawing on paper as you have the others. See Fig. 44.

164. Theory Proven on Glass.—Now apply this theory by making a drawing on the Glass instrumentally and to scale, representing the model as it will appear when the eye is opposite point 2 of the model. Place the eyepiece in line with sights 2 and make the drawing. Hold the Glass as before to see if the drawing will cover the object. If the farther square is not made

Fig. 45.—From pen and ink drawing by Anna M. Hathaway.

too small you may vary the distance of the eyepiece from the model and finally find a distance from which the drawing will cover the object. I wish you to assume the distance of the eye, and experiment until a SP. is found which causes the drawing to agree with the appearance, in order that you may understand how the appearance varies with the distance. Transfer this drawing to paper as you have the others.

In the same way make drawings to scale on the Glass representing the model as it will appear when the eye is opposite points 3, 4, 6, 7, 8 and 9. Test each by observation through the eyepiece, when placed exactly opposite the given pair of sights. Thus you will prove how perfectly the theory enables you to draw the object from any given position opposite its front face. Transfer each drawing to paper and write neatly the statement of each problem.

165. One-Point or Parallel Perspective.—The above drawings are in one-point perspective, and prove the rule, that all parallel lines that are horizontal, and that extend directly away from you, appear to vanish at a point on the level of your eye and exactly opposite your eye.

Two Objects.—Support a box 12″ high 24″ square two feet above the cube form, and parallel with it, and make a drawing of both objects as they appear from a point centrally placed and

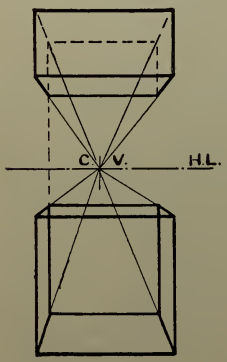


Fig. 46.

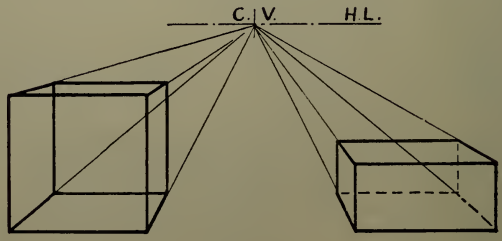


Fig. 47.

8″ above the top of the lower object. Observe from the eyepiece and draw on the Glass and then test by holding the Glass vertical and parallel with the front faces of the objects. Transfer the correct drawing to paper by scale after observing that the front faces are drawn of their real shapes. Fig. 46.

Now place the box on the surface that supports the cube, with a space of 3 ft. between the two. Place the front face of the box in line with that of the cube and draw both objects on the Glass as they appear from a point midway between the two, and 1 ft. higher than the top of the cube. Fig. 47. In testing be careful to hold the Glass vertical and parallel with the front faces of the objects, for if you incline the Glass the vertical edges of the objects will be represented by inclined lines.

Vertical lines below or above the eye appear to vanish, but they are never so represented, for this would cause perspective distortion when the drawing is not looked at from its proper station-point.

It is impossible to represent the actual appearance of two or more objects in one picture, for there can be but one C.V., and only the object that is directly behind C.V. can be represented in a perspective exactly as it appears.

Neither object is represented in Fig. 47 as it appears to the eye that looks directly at it, for when more than one face of a cubical form is seen all visible faces must be foreshortened. Both sets of horizontal edges must then appear inclined to the eye that looks at either object. A free-hand sketch of either would then have two vanishing-points, but when both objects are to be shown in one drawing there can be but one VP. Even one object can not be represented as the eye sees it when it is below or above the eye and has vertical edges.

166. Three Sides of a Room.—This subject demands the use of one vertical picture-plane, for all parts of the room can not be shown as they appear to the eye. The room is to be drawn from a SP. 4 ft. above the floor and 5 ft. to the right of the left wall. Make the drawing on the Glass by observation from the cardboard eyepiece set up in the given position and as far as possible from the end of the room. After you have drawn and tested the lines of floor and ceiling add those of the doors and windows and then make the drawing to scale on paper.

Make another drawing when the eye is 3 ft. above the floor and 6 ft. to the right of the left wall. Transfer this to paper.

Make a third drawing when the eye is 2 ft. below the ceiling and 4 ft. to the left of the right wall. Test by use of a step ladder and transfer the correct result to paper. The theory governing the above drawings is illustrated by Fig. 48.

167. Room from Measurements.—Make a theoretical drawing of a room 12 ft. high and 15 ft. wide as it appears from SP. 5 ft. above floor, and 5 ft. to right of left wall. A door 8 ft. high is in each wall. A window 3 ft. above the floor to its base and 9 ft. to its top is in both the left wall and the end wall. A cube

of 2 ft. is in left corner and a bookcase 9 ft. tall is in the right corner of the room. A table 2½ ft. high is in the center of the room. Do not copy or even look at Fig. 48 until your drawing is complete. Then compare it with Fig. 48. I have not stated the width of the doors, windows, bookcase or table or their exact location, and so you may have measured correctly all the heights I have given, and still find your drawing quite different in proportions from Fig. 48.

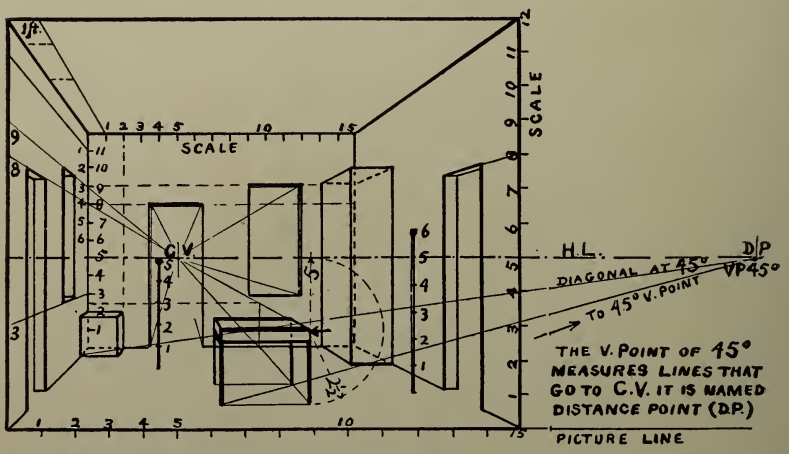


Fig. 48.—Height measurements.

You may begin this drawing on the plane of the farther end of the room or on that of the nearest lines in the room which are on the PP. In either case you must measure by the scale of the plane you start with, and must realize that one foot on the distant end appears much shorter than one foot on the PP., while between these two planes a foot can not be measured by the scale used for either the PP. or the distant end and must therefore be determined by a perspective scale as drawn in the upper left-hand corner of Fig. 48. Such a scale may be drawn and applied to obtain the height of the table.

The height of the table may be best found by bisecting the distance from the lower end of the table leg to HL., for HL. is 5 ft. above the floor and the height of the table is 2½ ft., which is one half of 5.

In this way heights may be quickly found anywhere in the picture. In Fig. 48 a vertical line at the right shows how the heights of figures 6 ft. tall may be obtained by dividing the dis-

Fig. 49.—From pencil drawing by Anna M. Hathaway.

tance from the floor to HL. into five equal parts, each representing one foot, and setting one part off above HL. to give the height of the figure (5 + 1 = 6). When the eye is 5 ft. above the floor any point on the floor is 5 ft. below HL., and so a scale for height measurements may be quickly placed at any point on the floor behind the PP. See the vertical near C.V.

A pole 10 or 15 ft. high from the surface of the ground upon which the spectator stands with his eye 5 ft. above the ground may be measured by taking the distance from the foot of the pole to HL. wherever the pole may be placed, and setting it off twice for 10 ft. or three times for 15 ft.

168. The Distance-Point.—Having assumed the scale of the end of the room and drawn the cube in the corner, to draw the table to harmonize with the cube you must remember that parallel lines vanish at the same point. The diagonals of the base of the cube and the square table must be parallel and at 45° to the end of the room. The cube having been assumed, you may continue the diagonal of its base that goes to the left, or the one that goes to the right, until this diagonal intersects the horizon, and thus determines the VP. of the parallel line the diagonal of the table. When you have assumed the length of the side of the table that is parallel to the PP., you will transfer this length to the side that goes to C.V. by drawing the diagonal of the table to the VP. in HL. located by the diagonal of the cube.

The VP. of 45° is thus the MP. for C.V., and hence is often called the distance point (DP.). There are two DPts. in every perspective; they are in the HL. equi-distant at right and left of C.V. This distance is always equal to the distance of the eye from PP.

The distance point is thus simply the VP. of 45° at either side of C.V., which enables measurements by scale on the PP. to be transferred to lines that are perpendicular to the PP.

Theoretically the DP. may be at any distance from C.V., but practically for pleasing results the DP. must be at least as far from the C.V. as the total width of the perspective. At a less distance perspective distortion is apparent, and increasingly so as the distance of DP. from C.V. lessens.

169. Two-Point Perspective.—This is often called angular perspective because it represents cubical forms at angles with the PP. by use of two VPts. in HL., one at the left of C.V. and the other at the right.

Place the model of Fig. 42 with its center on the eye level and its horizontal edges at angles of 45° with the table. Fasten the cardboard sight to the support so the center is on the level of the center of the model, and set up the rod so that with the eye

at the sight the front upright of the model appears to cover the upright at the rear. Then observe the model until you can draw it from memory on the Glass. When you obtain a drawing that covers the model perfectly place the Glass flat on a large table, or platform, or on the floor and continue the lines of the drawing that represent the edges at 45° until they meet. Do this with chalk and a long straight edge or with a thread attached to a thumb tack inserted at the VP. The four lines that extend to the right will meet at one point on the level of the center of the model, while the four that go to the left will meet at a point on the level of the center of the model and as far to the left of C.V. as the right-hand VP. is to the right of C.V. These two points are the VPts. of 45° (the DPts.) of Fig. 48 which enable you to measure distances on lines that vanish in C.V. They do not, however, enable you to measure distances on the lines of the model that are at 45°. To measure these edges at 45° you must

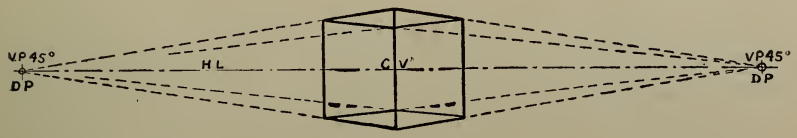


Fig. 50.

find the MPts. for the 45° VPts., but this involves the science I wish you to avoid until you can draw as artists do by eye without theory to aid you.

Transfer the correct sketch to paper instrumentally and make it look like the model by eye, or by determining the proportions of the sketch on the Glass. See Fig. 50.

Make and test as above another drawing of the model when your eye is on the level of the top of the model, and then transfer this result to paper to show that the VPts. will be equi-distant from C.V. and on the level of the top of the model.

Make another drawing with the SP. on the level of the lower face of the model. Test this and transfer it to paper to show that the VPts. are equi-distant from the center of the model and on the level of its base.

170. The Cube at 30° and 60°.—Turn the model until its horizontal edges that extend to the left are at 30° to the front edge of the table that supports the model. Those at the right will then be at 60° to the table. Adjust the cardboard sight so it is on the level of the center of the model and exactly opposite the nearest upright and then memorize the appearance visible

through the sight. When your drawing on the Glass will cover the model perfectly place the Glass flat on a large drawing board or on the floor and continue its lines as already explained until they meet. The four that vanish to the left will meet in one point on the level of the center of the model, and the four that vanish to the right will meet at one point on the level of the center of the model and at the right of C.V. This point will be much nearer to C.V. than the left-hand VP. The right side of the model appears much narrower than the left side. The pro-

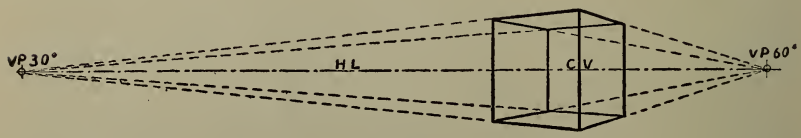


Fig. 51.

portion is, however, not 1 to 2, and the left VP. of 30° is much more than twice as far from C.V. as the VP. of 60° at the right. Of course these VPts. and the widths can be measured exactly by the science of perspective, but this we do not wish to study at present, so you may transfer this sketch to paper, making it of the proportions of the one on the Glass, and small enough for the VPts. to come on the paper. Fig. 51.

As the cube is turned away from its position of 45° (Fig. 50) one side makes an angle greater than 45° and the other side an angle less than 45° with the PP. The VP. of the side at the greater angle approaches C.V. while that of the side at the smaller angle increases its distance from C.V. Continue to turn the cube until one face is parallel to the PP. and the lines of this face cease to vanish, while the VP. of the other face merges into C.V. and is the only VP. of the drawing. Fig. 52 represents objects at various angles with the PP.

171. Three-Point or Oblique Perspective.—Edges that are not parallel with the PP. appear to vanish, and so when none of the edges of a cube are parallel, it must be represented by lines that vanish in three VPts. Such a drawing is said to be in oblique perspective, and not more than one of its VPts. can be in the horizon. When one set of edges is horizontal with its VP. in HL., another set will vanish above HL. and the third set will vanish below HL. and also below the VP. that is above H.L. Fig. 53.

The cube is not in oblique perspective when its edges are at an angle with the ground and parallel with the PP., for in this

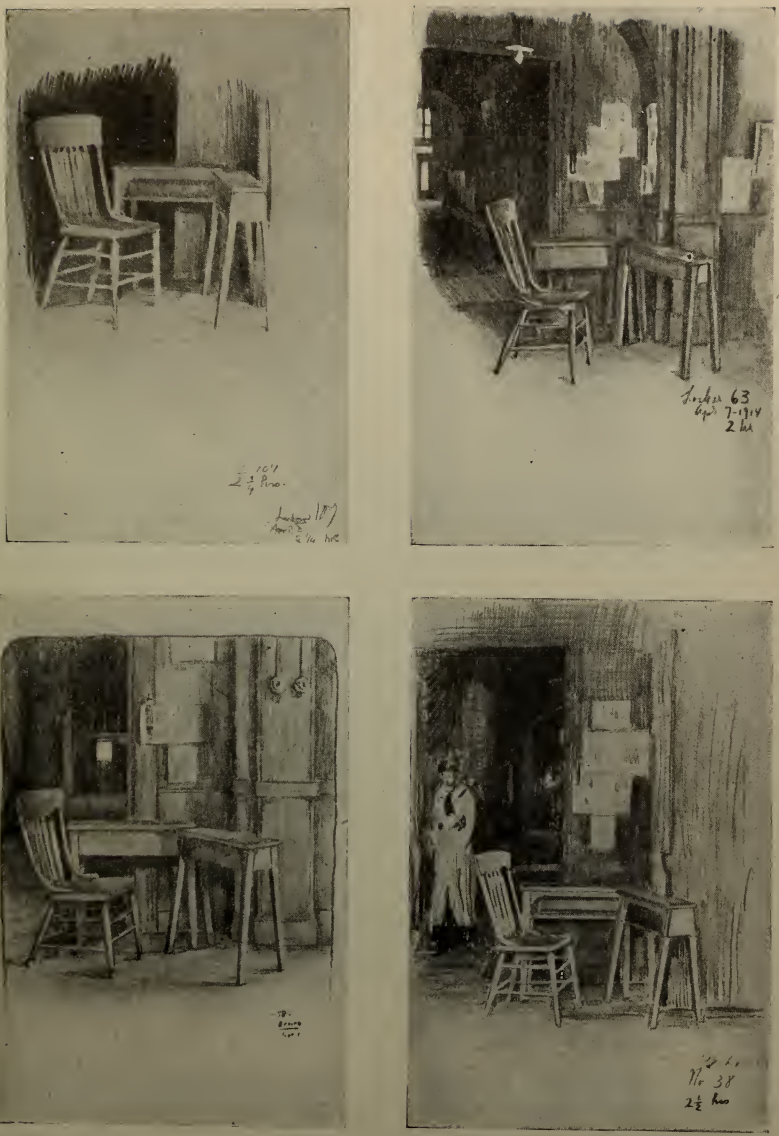


FIG. 52.—First-year examinations.

case there will be only one VP. (C.V.). The edges parallel with PP. will be represented by parallel lines at their real angles with the ground. Fig. 54.

172. Many VPts. in One Drawing.—Fig. 55 shows several books at different angles with the PP. Fig. 56 is a reduced-

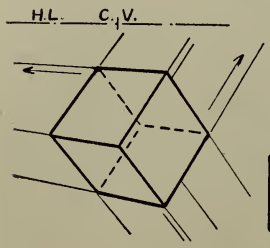


Fig. 53.

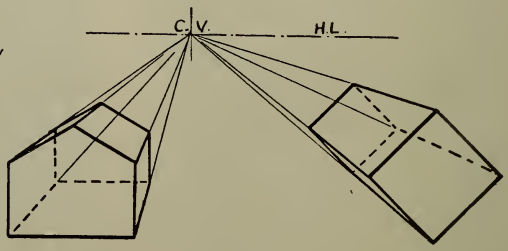


Fig. 54.

scale drawing that brings all the VPts. upon the page. There might be other objects in oblique positions in the group, and thus it is possible for every new object to add two or three VPts. to the drawing. To determine these VPts. and their MPts. re-

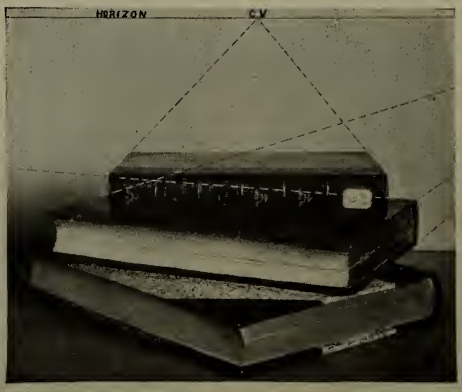


Fig. 55.—From photograph.

quires a thorough knowledge of descriptive geometry as a basis for the study of the science of perspective. With such knowledge it is possible to determine not only every VP. but to measure exactly every distance on even all the oblique lines. Cast shadows by sunlight and lamplight and reflections in mirrors

may also be exactly determined, but this is the pure science the artist seldom needs, and so the only explanations I will give relate to the simple problems of the artist.

173. Book in Oblique Perspective.—Place a book flat on a table with its cover raised at any angle. Draw the book on the

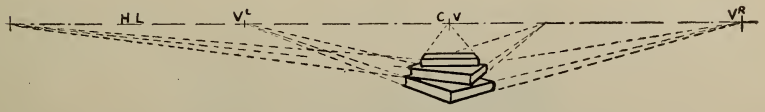


FIG. 56.

Glass and place the Glass, with the correct drawing, flat on a table or the floor so that you may continue all its lines until they vanish.

Retreating lines always vanish in the direction of their farther ends. The visible side of an object must be nearer the eye than the opposite parallel and invisible side, and so you will find the lines of a correct sketch converging as they approach the invisible surfaces of the object.

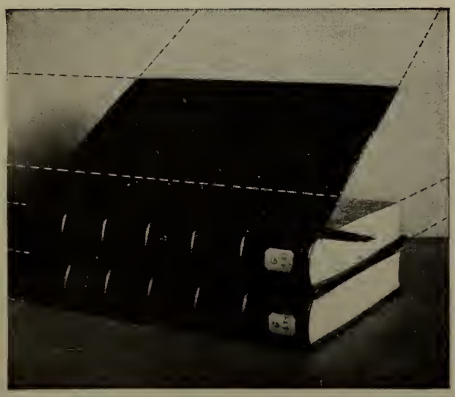


FIG. 57.—From photograph.

The horizontal lines of the ends of the book vanish at a point in HL. The oblique lines will vanish at a point directly over this VP. in HL., Fig. 57, but if you look at this book from the opposite side the inclined lines will vanish at a point directly under the VP. in HL.

Fig. 58 is a reduced scale drawing that places the three VPts. on the page.

174. Fig. 59 shows how the book will appear when its long edges are parallel with the PP. The short edges that are horizontal then vanish at C.V. while the inclined lines vanish just over C.V.

175. Theory Injures the Beginner.—These drawings on the Glass, if carefully made and studied, will make clear the practical points that the artist needs, also all that the teacher of elementary

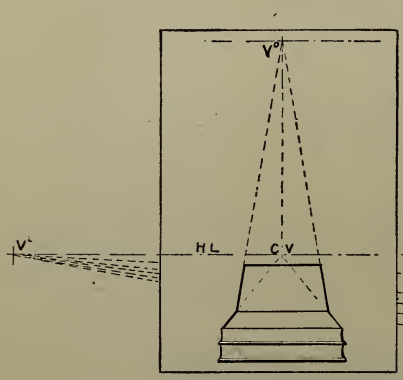


Fig. 59.

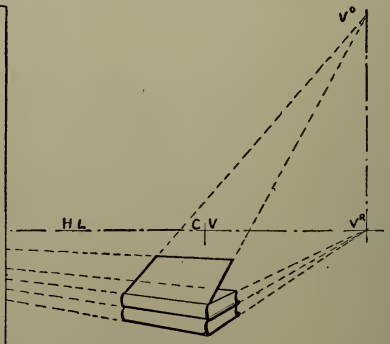


Fig. 58.

classes should teach. It is a serious mistake to begin with theory, especially the scientific. It was many years before I proved this to my own satisfaction by deferring theory each year a little longer, and finally until practice without any theory had given the entire class the power to draw by eye alone with professional skill. I then found that the study of theory caused all students to lose power in drawing from objects, and that it was a hard struggle for many to regain reliance on vision. When the Grammar School gives real visual power this difficulty may not continue, but as long as art students must begin visual training and theory at the same time there is little chance of their gaining real visual power quickly.

176. Theory Necessary for Teacher.—It is impossible to teach advanced classes without finding some students who are able to study theory and who insist on doing so. If a teacher is not able to aid such students he must hurriedly begin to study the science, or admit his ignorance. Therefore if you wish to teach in High or advanced schools you are advised to finally study the

science of perspective, which you will find in many excellent books.

Students who wish more on the subject of Free-hand Perspective Theory will find it in the book of this title by the author.

From photograph.

Chapter VI.

DRAWING NO MORE DIFFICULT THAN OTHER SUBJECTS.

177. Grammar School Examinations.—The general belief that drawing from nature is so difficult that it should not be attempted in the Grammar Grades has not deterred occasional teachers from securing splendid class results, even by the old methods. Such instructors prove that real drawing can be taught when the teacher possesses so great a love for art and for teaching that the hard work involved is forgotten in the final success of independent effort and real power.

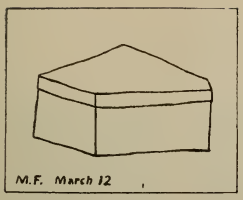
Any one who has seen good class results gained without the use of the Glass finds it easy to believe that the grade teacher without special training or ability can obtain such results as are shown by Figs. 60, 61, 62 and 63, if only the Glass is used in the right way.

Fig. 60 shows the results of a half-dozen lessons on the Glass in a class that had never before used the Glass. The seven pupils, whose work before and after use of the Glass is shown, made the greatest gain, but all the pupils gained in marked degree.

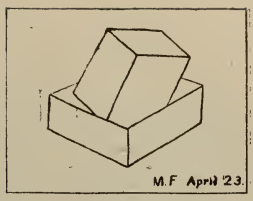
Fig. 61 reproduces the work of an entire class of Grade VI and was done under the direction of a grade teacher. Many of these drawings will seem very poor to those not familiar with public school results, but in spite of their defects, this Grade VI work is better than that of a large percentage of Art School students just graduated from the High School. This will appear upon study of Figs. 64 to 71 inclusive.

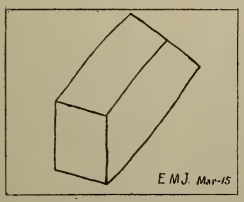
Figs. 62 and 63 reproduce the best and the poorest drawings in examinations given by the grade teachers in Grades III and IV. In these low grades as in the higher, 75% of the pupils succeed as well with drawing as with other subjects, and thus prove that there is no need of depriving young pupils of the pleasure and profit which come from truthful study of drawing. Some pupils do better in drawing than in other studies, and they need the stimulus of this success to help them with more difficult subjects.

178. Art School Methods.—Those familiar with Art School students expect the few to succeed and the majority to fail even in the alphabet of art, therefore, the gain made by every student in a class of thirty-four will be of interest.

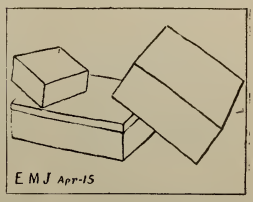


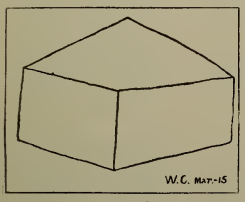
Three hours' use of Drawing Glass in Grade VII. accounts for the gain.





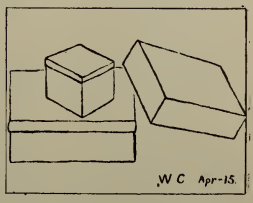
Drawings on same level are by same pupil. Those at left before use of Glass, those at right after Drawing on Glass in place of paper for a month.

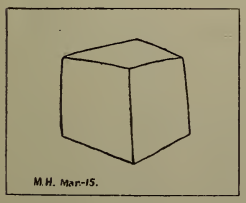




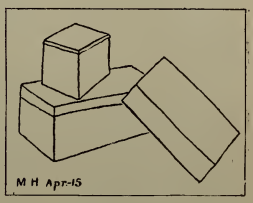
Glass was not used for right-hand drawing and no aid was given by teacher.

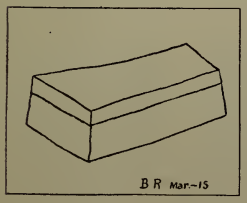
Glass was not used in lower grades.



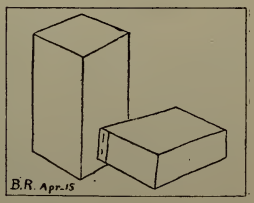


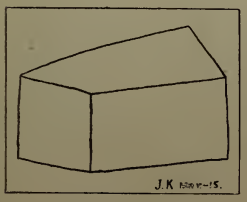
This method enables average grade pupil to excel graduates of high school not thus taught.



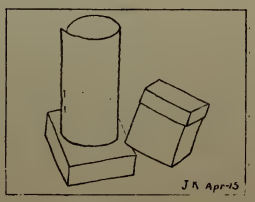


A set supplies several rooms, lasts a lifetime and reduces bills for paper and books.





Not an aid for picture making but for the perfect vision that needs no measures or tests.



BEFORE USING

AFTER THREE HOURS' USE

FIG. 60.

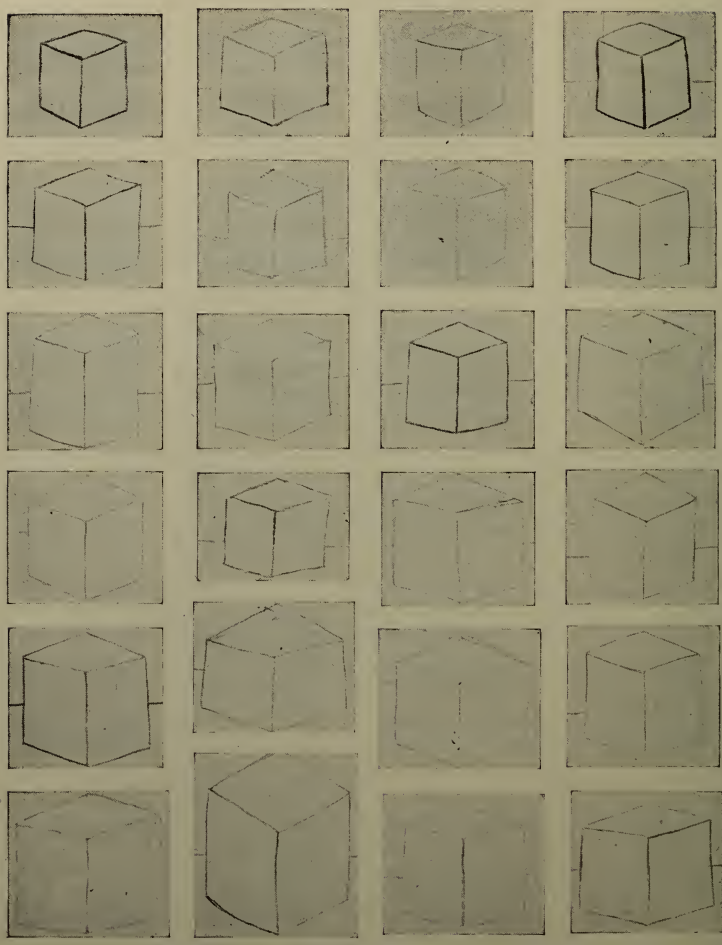


FIG. 61.—The class of twenty-four pupils had used the Glass before this lesson, also in lower grades. These drawings were made directly on paper, the Glasses not having been distributed. A paper model was on each desk. No assistance was given by drawing on the blackboard, or for students, or by telling them what to draw. Erasers were not used. Though many drawings are imperfect the set proves that object drawing can be taught in low grades.

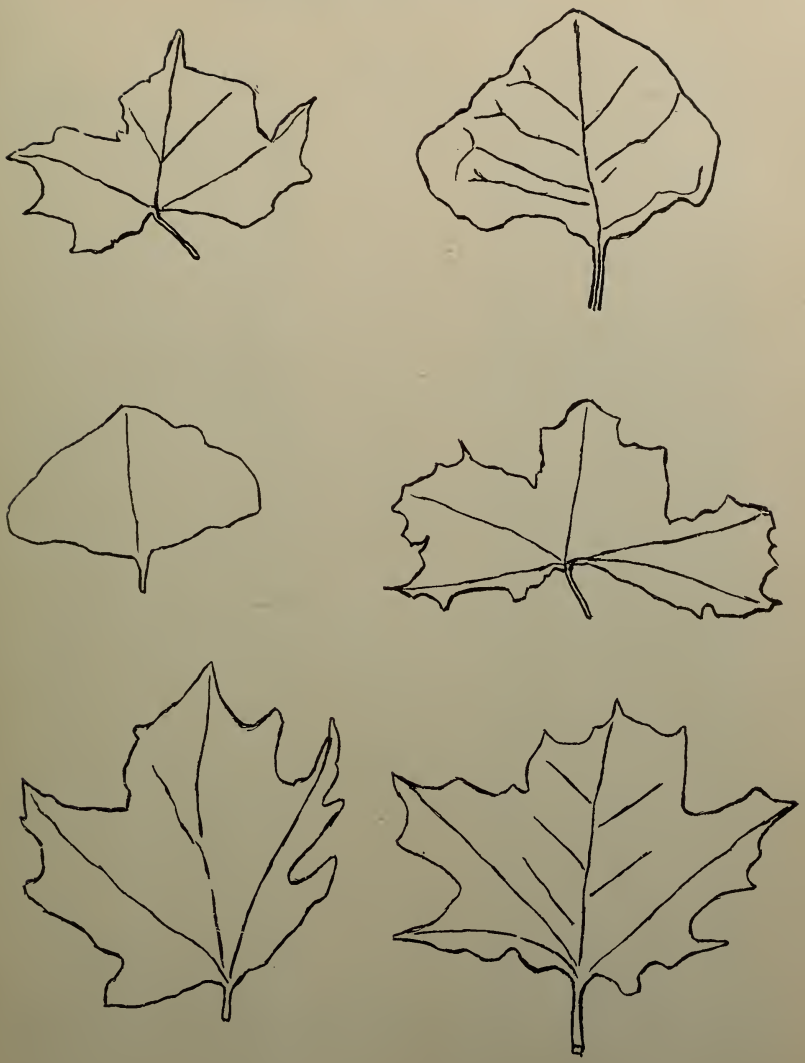


FIG. 62.—The best and the poorest drawings are reproduced. They were drawn directly on paper with the aid of the Glass used only as a finder, as shown in Fig. 75. The Cross crayons were not used. No assistance was given by drawing on the blackboard, or on the papers, or by pointing out mistakes.

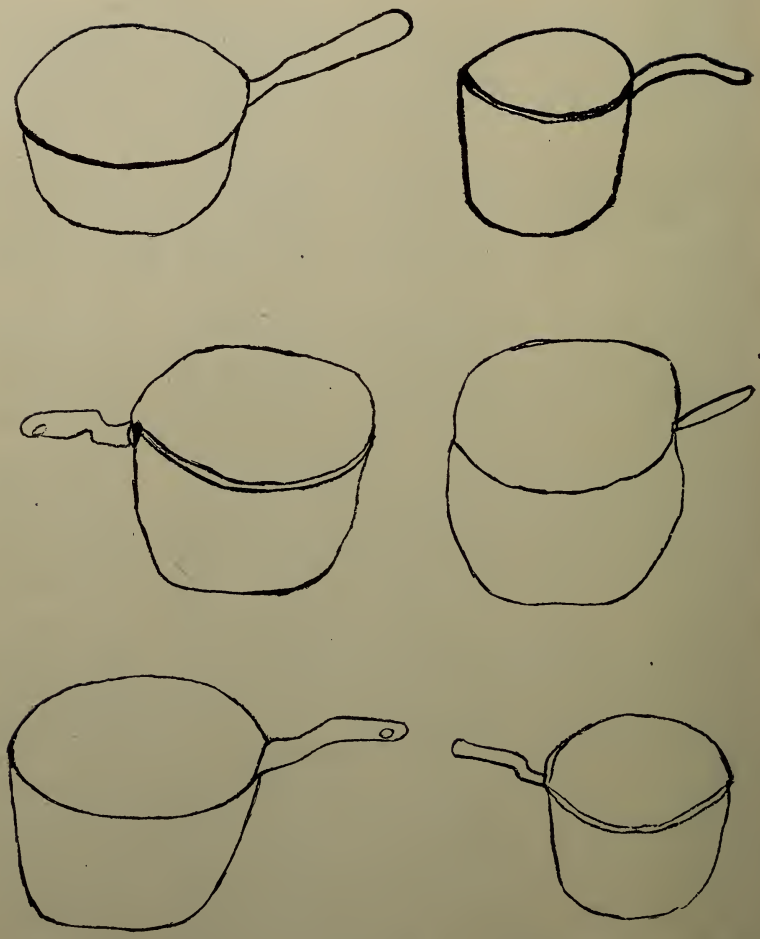


FIG. 63.—The best and the poorest drawings are reproduced above. They were drawn directly on paper, the Glasses being used as finders. Each pupil brought any kind of a small dipper and placed it at the back of the desk. No assistance was given by drawing on the blackboard, or on paper, or by pointing out mistakes.

September 28, before use.

November 30, after use.

FIG. 64.—Gain made in nine weeks.

When I first began to teach, I used to work a little upon my students' drawings or at least suggest ways in which they could be improved. At the end of the year I could show only the re-

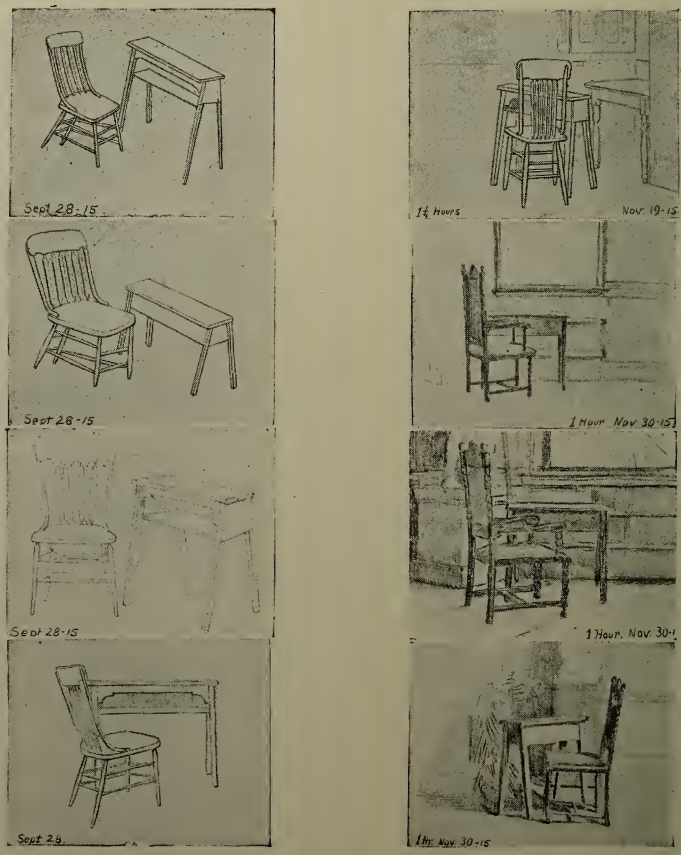


FIG. 65.—Freshman examinations. Those at the left were made on entering. Those at the right were made nine weeks later. The two lower students were the best prepared.

sults of the few talented students, and knew that the work was not a true index of their power.

Gradually, I found ways to substitute for my own vision that of my students; and, finally, I refused not only to draw for them,

FIG. 66.—The left-hand drawing under each number was the entrance examination. The right-hand drawing was made nine weeks later.

but to tell them how to make corrections. Then the results improved, and when I called for many self-corrected quick sketches in place of a few long finished efforts, the gain was so marked that I began to exhibit the work of every student in the class.

179. Art School Examinations.—Figs. 64 to 71 inclusive show the work of a class of thirty-four, both upon entering and nine weeks later. In the case of a few students who were not present on September 28 or on November 30, other drawings are shown. Fig. 64 compares the entrance examination with one made nine weeks later by five pupils who were poorly prepared. The drawings on the same level are by the same student.

Fig. 65 reproduces the work of four other students. The two that made the upper drawings were poorly prepared, while those who made the two lower were the best students in the class.

All studied free-hand perspective ten hours each week, used the Glass about five hours per week, and made quick sketches on paper the rest of the time. These they corrected by use of the Glass and a thread as explained in Section 54.

Figs. 66 to 70 inclusive show the work of the twenty-five students who, upon entering, did neither the best nor the poorest work.

It was impossible to find drawings made on the same date and in the same time by all the students, but comparison of the two drawings by each student will show not merely better drawings but the power to do more in a given amount of time after use of the Glass.

The faults in perspective in the first seven drawings are apparent at a glance. Those in many of the other entrance examinations are not so easy to see. However, careful comparison of these drawings will prove a general and nearly equal gain by all.

I regret that I can not reproduce a set of five-minute sketches made at the end of the year from the same chair and table upon which forty-five minutes were spent in September. If the five-minute sketches were strong enough to reproduce, they would show that nearly all these students were able to sketch true perspective and true proportions in five minutes, without the aid of the Glass or any other test.

Fig. 71 shows the gain by the student who made the poorest drawing and who at the end of the year did none of the best work. The middle sketch, however, shows ability to give visual proportions and perspective for four objects in ten minutes. The street scene, though it was almost the first effort from such a subject, shows some power to use the eyes out-of-doors. When

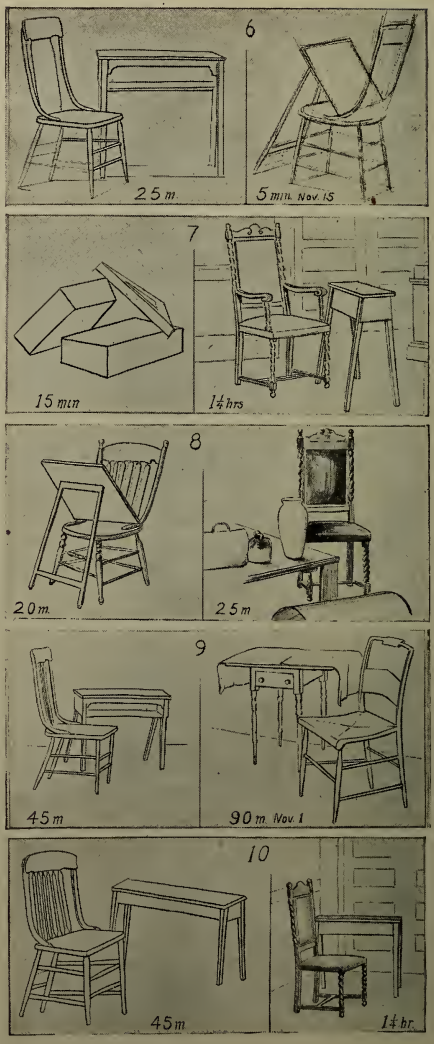


Fig. 67.—The gain made in nine weeks by five students.

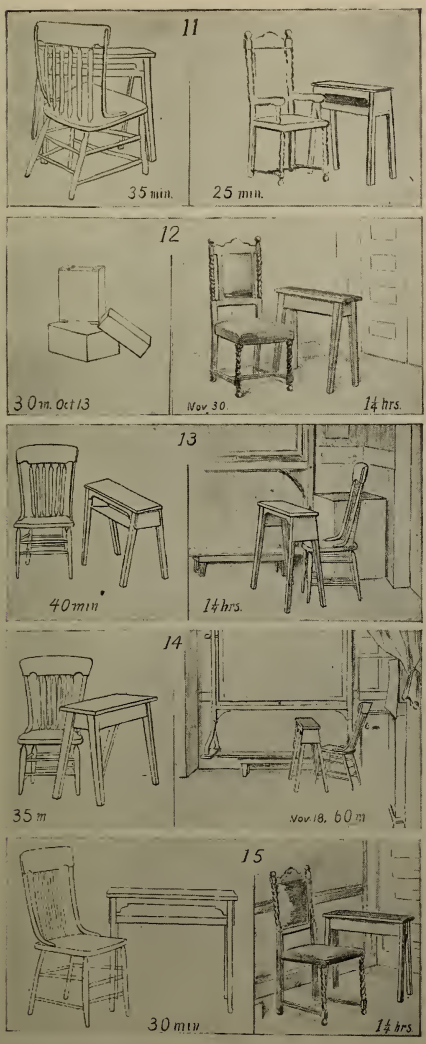


FIG. 68.—The gain made in nine weeks by five students.

compared with the entrance drawing, much gain is apparent in spite of defects.

180. Gain Without Theory.—The improvement made in nine weeks was not due to study of theory, for this was not begun till December when, for the first time, the pupils were told and made to prove that parallel lines appear to vanish at a point. The gain made was due equally to use of the Glass and to artistic methods of making quick sketches on paper without use of pencil measurements.

During the first month, the sketches were done in about five minutes and often less time. In the second month, the time given was from two to ten minutes. The third month included fifteen-minute sketches, and the sketches of the fourth month took from a half-hour to an hour and a half. After February, most students were able to dispense with the Glass and draw by eye alone with professional accuracy.

These students were compelled to work in outline alone, for my teaching was confined to this medium. This long drill was tiresome but when the students discovered that they could make interesting sketches without assistance, they were thankful for the training which had given this power.

181. Vary Method and Medium.—There is no reason for

confining beginners to outline or to any other medium, for all are useful to the artist. Students should have before them photographs of sketches in all mediums and methods done by the artists of the past, and they should be encouraged to make similar studies.

Students should, from the start, study in outline, but occasionally sketch in values or in color to increase their interest in the outline drill. They will understand the necessity for this when they find that right use of the Painting Glass takes away the difficulties in study of values and colors to such an extent that power to paint depends principally upon ability to draw.

First-year students can do good work in outline, light and shade, and in color if they are willing at the start to work faithfully upon uninteresting subjects, even as the student at the piano labors long and hard upon the necessary finger exercises.

The question of what to write to fill up the text of this page and the next was answered as it was asked by a friend whom I had not seen for years and who wanted to examine the Painting Glass as soon as I told him about it. After short study of out-door and in-door effects through the lenses, he

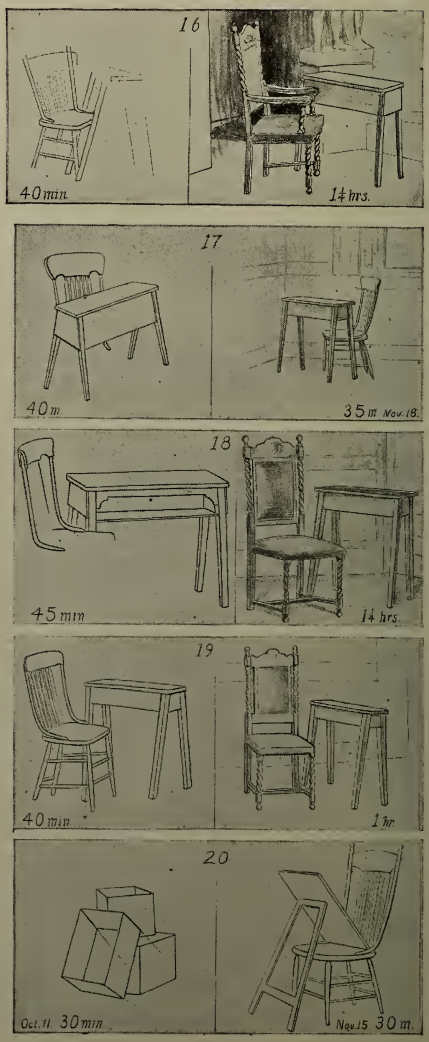


Fig. 69.—The gain made in nine weeks by five students.

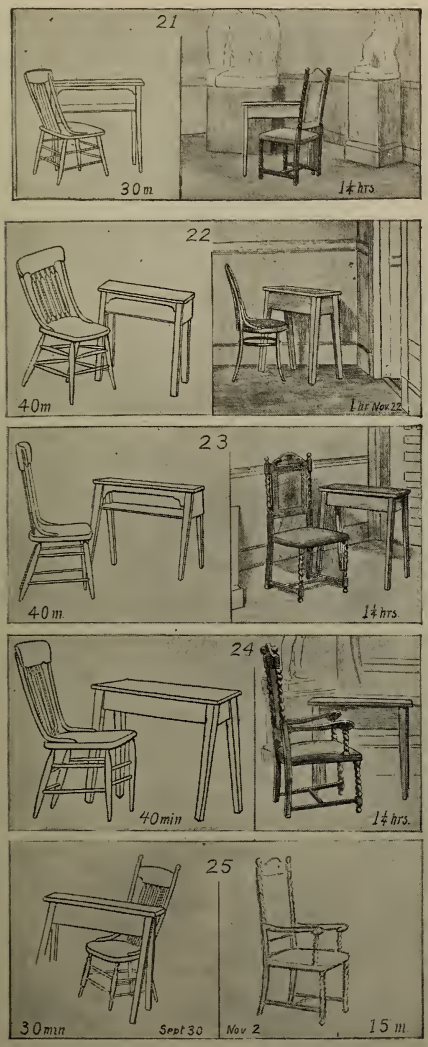


FIG. 70.—The gain made in nine weeks by five students.

said that they showed him more color than he had ever seen before, and he asked to have the Glass for his own use, saying that the painter who would not find it helpful must have queer ideals. This artist was noted thirty years ago for his fine color sense, and I state this incident to encourage the student to rely on the lenses as long as he is in the student class.

As this painter left me he said, "Be sure to make your book emphasize the fact that the problem of becoming an artist is not made easy by this Glass. True vision at best is only the means to command of the alphabet that makes art expression possible. The student who has gained true vision has taken only the easiest step. After this step is taken, to produce art he must forget all rules, theories, and formulas, and go to nature for the notes and inspiration that may enable him to produce a 'handsome picture' that is his own interpretation and his own expression. To do this requires the creative power of the artist. It is beyond that of the mere copyist, and the power of the schools to teach."

Sketches by the same freshman.

Examination, September 28.

Examination, November 30.

10-minute examination, June

Half-hour examination, June.

FIG. 71.

Chapter VII.

DRAWING IN THE PUBLIC SCHOOLS.

182. The present condition of drawing in public and elementary schools was clearly stated in an address on "Blind Alleys" delivered by Leslie W. Miller, in April, 1917, and printed in the report of the eighth annual meeting of the Eastern Arts Association. Lest it seem that I am making unwarranted statements I wish to quote part of this address.

Blind Alleys.—"Now while the new educational schemes doubtless represent a great deal of admirable ingenuity, I am afraid they are apt to contain just such seeming, or pretending, short cuts which are only blind alleys after all. They undertake to instruct a pupil straight into the field of knowledge which he particularly desires to explore and even hold out a more or less definite promise to train him for the vocation which at the mature age of fourteen he has decided to make his life work. . . .

"For my own part I feel very sure that it has been greatly overdone already. Indeed, so much so that I sometimes wonder whether the introduction of the kindergarten idea into our educational system has not done more harm than good. Of course, it sounds very much like heresy to say anything against so beneficent an institution as the Kindergarten. . . .

"But the methods which it relies on have sometimes been taken too seriously by teachers and by being carried into fields of activity for which they are not adapted, they have to a considerable extent introduced an element of triviality into the work of the grades, and have lowered the standards of such forms of educational endeavor as are essentially disciplinary in character.

"What are we to make of this epidemic of insanity that has struck so many apparently well-meaning, sometimes fairly well-trained artists. . . ?

"Strange things have been done in the name of art and she herself has been held responsible for some pretty dark deeds at one time and another, but certainly nothing like this has ever happened to her before.

"Well, cubism, post-impressionism, futurism and what not, are only so many blind alleys into which poor misguided art, in search of short easy cuts instead of the perfectly well-known

but arduous path which she has followed since the foundation of the world, has wandered and got lost—that is all. . . .

"And now for the way out. . . . Now right tendencies in elementary education are concerned with fundamentals and with fundamentals alone. The higher education may specialize all it likes and as a matter of fact when it gets to be really high it will of necessity specialize very narrowly but to allow the specializing methods of post-graduate university work to set the pace for the work of the grades, or even for the ordinary high school, is as fatal a mistake as the invasion of these same precincts by the methods of the kindergarten has been shown to be.

183. "In all creative work—whether constructive or decorative does not at all matter—the really fundamental thing and the one that links it up with the whole field of general educational effort, is the study of design. But design is drawing properly understood and applied, only this and nothing more. All applications and developments of this creative purpose, in whatever material or by whatever process the ultimate expression is attained, depend first and mainly upon ability to draw, and the true test to be applied to all schemes to get variety and interest and immediate profit into or out of our courses of study amounts in the last analysis only to this,—is the pupil really learning to draw and to understand and accomplish the things to which a knowledge of drawing is the key? Now it is of no use to say that all this is well recognized and may be taken for granted as in operation practically everywhere already. We know very well that it is not. On the contrary we all know only too well that honest, solid work in drawing is very much at a discount; that it has far too often given place to playing with colors and having fun with make-believe art in the common schools, and that even in the art schools themselves it is often woefully neglected and sometimes openly discredited. I have heard its utility, and even the need of teaching it at all, seriously questioned by the head of one of the, potentially at least, greatest technical schools in this country, on the ground that designs could be concocted pretty well by means of tracings and photographs; of scissors and paste-pots, etc. And that possibly the time and effort that the effective study of drawing calls for could be more profitably spent in other and easier ways. And I am sorry to say that while this statement of the case by one in high authority is rather exceptional in its shameless frankness, the attitude of mind which it indicates is by no means an exceptional one, as most of us would like to think it is. There are far too many evidences all around us of the kind of searching for easy ways and short cuts for something that will pass muster in the way of attainment, that this

kind of underestimate of disciplinary work implies. For drawing means discipline, just as all real study does, whatever the field in which it is employed; and when it ceases to have value as intellectual discipline, it ceases to deserve the place which the present generation of teachers, more strenuously than any of its predecessors, has claimed for it. Let us get back, then, to the fundamentals of drawing properly taught as that form of mental discipline most directly related to creative effort and industrial endeavor. Let the childish playthings, the amusing theories and the easy substitutes for earnest study go. Do not delegate to the kindergartener, to the half-baked psychologist, or to the theorist in pure design, in color or in anything else the work that can only be done by the man or woman who knows enough about drawing to adequately recover the truth about things as they are and has power to visualize in advance things as they ought to be. Stick to that principle and the way out of our present muddle will not be hard to find."

184. Walter Smith's Books.—The drawing books designed by Professor Smith were intended to give every graduate training in the elements of Art, Design, Free-hand Drawing, Historic, Ornament, Perspective, and Working Drawings. They were in harmony with the general effort of that period to study the fundamentals instead of striving for interesting but superficial results. Many text-books of that period involved hard work for both teachers and pupils instead of that superficial pretence which, in the words of the New York Board of College Entrance Examiners, "actually tended to degrade the taste and to blunt rather than to sharpen the observation of the pupils." Section 266.

Though Professor Smith and other authors of drawing courses refused to substitute superficial display for an honest foundation, there were publishers eager to supply the demand for interesting results not based on honest study or real power. New drawing books were published frequently, but gradually their sales decreased when it was found that their use did not give graduates the power to draw. Then their publishers decided that they had made a mistake in trying to teach object drawing in the Grammar School, for they considered that only a few students would become artists or use drawing in their life work. The publishers claimed that the study of design should take the place of object drawing because all students would benefit by the study of art and design. This decision being made, the books that were not in harmony with it were discarded and new ones published which increased the time given to study of art and design and decreased that given to object drawing and to industrial drawing.

Fig. 72.—From pencil sketch by Anna M. Hathaway.

185. Publishers' Methods.—When the decision was reached that object drawing would benefit only the few who would use this power in their profession, every influence was exerted to substitute for object drawing the study of art and design. Competent artists and teachers in the leading schools were forced to give place to those who would support these new views of the slight importance of free-hand drawing, and gradually the study of this subject in the Grammar School has ceased. In the High School drawing is now generally optional. When studied at all the effort has often been more for display, than for the basic principles prescribed by Walter Smith. As a result of neglecting drawing for many years, even the talented students who enter art schools are seldom able to represent simple objects correctly.

This unfortunate result is due to the fact that the artist has not been consulted or considered if his views favored the old-fashioned drawing instead of the courses published in drawing books one of which is to be used each term by each pupil in each grade.

Though these books are not now as generally used as in former years when publishers were influenced by possible profits more than by such educators as Walter Smith, still the control of art education to this time has been by the publishing firms who have made it profitable for teachers to follow the plans of the text-books, even if they have not bought them yearly for use in the grades.

Text-book publishers are not only directly responsible for many bad methods and inartistic copies, but also for the unwillingness of other publishers to bring out competing books even when they have been better. The sale of books and materials has not depended upon their merit so much as it has on the ability of publishers to compete with the political methods of the firms that have controlled public opinion.

186. Art School Control.—Text-book influences have been considered paramount in many important schools. In colleges and normal schools methods have changed with those of the leading text-books. This may seem natural and right until it is realized that the artist would substitute blank paper for most of the pictorial copies and would seldom permit the study of art theories to take the place of that training of eye and hand which is given by drawing from objects and from nature.

187. No Fashions in Art.—There are few new and good methods in drawing, for the masters of the past have furnished the best that can be given. Artists have always drawn in one way, and Michael Angelo recorded this way in a drawing lesson

that can not be improved. This lesson is reproduced by Fig. 12 and represents a female figure by three drawings. The first one shows the light touches of the blocking-in lines, and the next, a little stronger, gives a little more detail. The upper drawing is still more complete. In the original a fourth sketch is seen at the left, so faint that it does not appear in the reproduction, and this makes the lesson more complete by showing the delicate way in which an artist begins his sketch with the faintest suggestion possible to make of its principal masses. In spite of this perfect lesson given so long ago and repeated by the practice of all the masters, few graduates of the High School who enter an Art School even know how to begin to make a sketch. Instead of sketching lightly the action and proportion as all artists begin to work, students generally begin with details and make mechanical drawings, finishing the parts one at a time. Thus they prove how the influence of the publishing firms has placed unwise emphasis on theories and technique and been so harmful that students who have never studied drawing gain much faster than those who must overcome the influence of bad instruction in the public schools before they can begin to profit by an artist's instruction.

188. Control of Teachers.—College degrees are now given for courses that do not involve more than from six to ten hours of drawing and painting each week. A degree after such limited studio practice can not mean much power as an artist except in the case of artists who wish the degree for its assistance in gaining a position and who enter able both to draw and to paint. Unfortunately the drawing teacher has needed a degree or the assistance of a text-book firm in obtaining a position to teach even more than he has needed power to draw and paint from nature.

189. Teachers Overworked.—Teachers of much native ability fail to overcome the bad training they received in schools reflecting text-book influences. because they are subject to the propaganda of the text-book firms even if not indebted to them for their positions, and because their school duties often require all the hours in a week not demanded by the need for food and sleep. Teachers are often equally busy during the periods supposed to be vacations. Thus overworked drawing teachers have neither the time nor the strength to draw and paint, even when such is their chief desire.

190. The French Method.—This does not happen in Paris, where it is understood that only the teacher who is creating is able to give the best instruction. It is the custom in Paris to appoint as teachers of drawing only those who are actually pro-

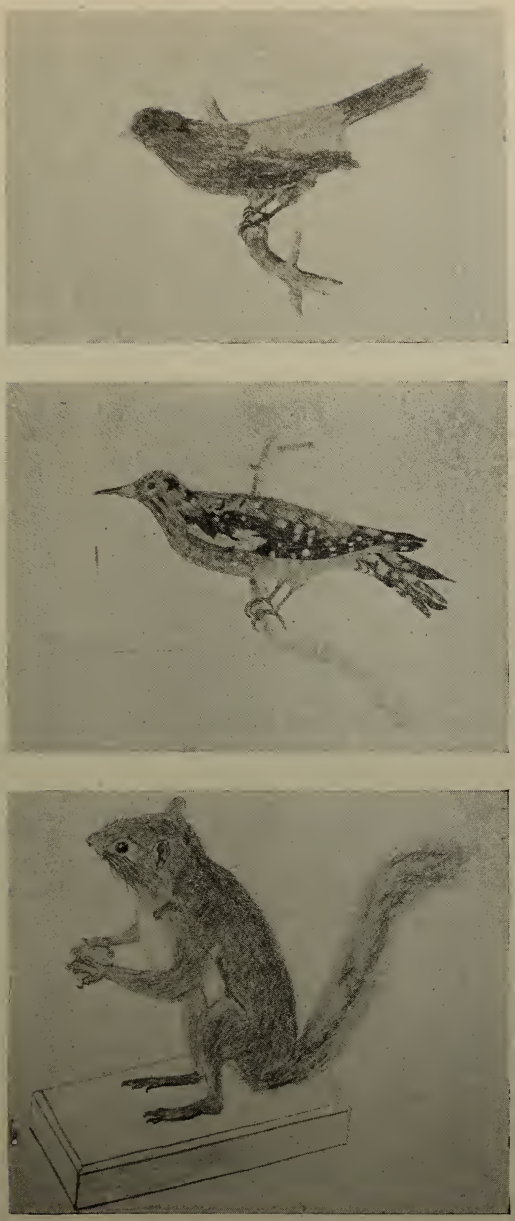


Fig. 73.—Grade IX. Lead pencil drawings from stuffed specimens.

ducing for at least two days each week. If we could be equally sensible and pay the drawing teacher a living salary for teaching not more than four days a week we would avoid the present waste of time and money.

191. The artist is the best teacher for advanced students largely because he has faith enough in himself to refuse to be misdirected by foolish methods and popular fads, even when they are presented by text-books and supported by the many teachers who are influenced by publishers. The artist until very recently has believed in study of nature and has insisted on exact and truthful representations of nature without placing emphasis on the medium or technique employed. Those artists who have departed from the traditions of the masters so far as to cease to value good drawing, construction, and color do not aid the cause of art by teaching. On the contrary they injure it by sanctioning the dishonest methods that have grown out of the desire of the publishers to sell books, and the effort of teachers who are not artists to furnish principles, steps, and methods more complete than any directions for teaching that have been left us by the great masters. The best painters have been busy producing while teaching and writing has seldom been attempted by those competent to express the artist's viewpoint.

192. Different Methods in Different Schools.—The work in public schools is very different from that in art schools and demands many and exact directions for securing truthful object drawings. Probably no great painter could give these directions successfully even if he could be induced to attempt it. Therefore instruction in the public schools and in elementary schools must often be left to those who are not artists. The problem is to give the needed directions in a way that shall not destroy the individuality of students or teachers and thus cause the work to become more mechanical than artistic. This problem can be met only by confining the directions to matters that relate to vision and subjects to be studied more than to steps, stages, and the technique of the drawing.

If I had taught in the Grammar Grades I would have given the same directions that my sister has given, for I have found an occasional student in the art school who has needed to make a tracing of an object in order to understand how to test a drawing made on the Glass. In the Grammar School such students will be found often, and so a few lessons in tracing are wise.

There is not time in the Grammar School for the long practice needed to perfect vision without thought of theory, therefore it is wise that each pupil should discover by use of the Glass the essential theories as Miss Cross has directed.

193. Full Pay for Four Days.—Directors and special teachers of drawing not including mechanical drawing, should have two days each week for study and studio practice and should receive pay for full-time service. They should not be required to be professionally engaged when not teaching, as this might prevent the employment of some of the best teachers I have ever known who have not cared to draw and paint, but have been successful because they forced their pupils to make their own observations and their own drawings, having proven that good results are impossible as long as the pupils must rely in part on the teachers' eyes or hands—born teachers if not born artists.

The class room and other duties of the teacher of drawing and painting in the upper grades and the High and Technical Schools should not be more than can be done in four school days. Art can not be well taught until teachers have at least two days each week free for studying, planning, visiting other schools, rest, recreation, or art work as they may desire. Vacations and especially the summer one should be free for travel and art study.

On the basis of this claim it might be said that all teachers would appreciate this allotment of time, but it is to be remembered that the artist is the creative mind and time must be allowed in which to create.

194. Nature is the best teacher, and art students who study her honestly are better off with so little instruction that I refrain from stating the time needed per week or month. The practice of the best art schools should be considered the world over, and all should realize that the inspiration and experience of the best artist, if obtainable only at long intervals, are far more valuable than instruction all day and every day that relates to technique and finish more than to action, proportion, sentiment, color, values and tone.

195. An art school student can work without supervision when public school classes can not do this. It will be difficult to quickly train the grade teachers so that they will need less assistance from the special teacher of drawing, and it is a problem how to arrange matters so that the drawing teacher's work may be as fully completed in four days as it is now in five.

Possibly when the full benefit is gained from the use of the Glass and new plans and courses, a day may be saved. If not, some way must be found to relieve the drawing teacher. Drawing can not be well taught by artists who are so overworked that they are unhappy both mentally and physically and who have no time in which they may draw and paint.

If the public understood that the French method, or some other plan that frees the drawing teacher from full-time service

Fig. 74.—Grade IX. Lead pencil drawings from stuffed specimens.

is absolutely necessary if good instruction is to be given, the way to do this would be speedily found. America's mistakes are due to ignorance. But this nation will finally insist upon having all that is best in education.

196. Requirements Repel Artists.—The artist refuses to teach now because he can not practice his art, but if he could give less than all his time to the public schools, young artists of great ability would gladly teach, and the unsatisfactory conditions now prevailing would give place to honest study and successful results.

When the drawing teacher has been as free in America for a few years as in Paris, art ideals, standards, and methods will become sane and effective in all Normal Schools and Universities, and an impetus will be given to art education that it has never known. The inspiration of the artist and of nature study will then supplant copies that are often mechanical, and theories that fail to interest or profit young pupils as much as would their discovery through personal experience in drawing from nature.

197. Education Involves Work.—The idea that students should be interested and avoid work is not a recent one, and as shown by the following extract from a book written in 1847*, its results in the last century were identical with the inefficiency of the graduates of today.

"Children ever eager for change readily clamour for new copies. Certain teachers believe it increases their interest and enthusiasm if they give in to their whims, but this is a serious and lamentable mistake. For as his importunity has won him one new copy the child soon clamours for another, and so recoiling from the slightest difficulty, he never really masters any of his tasks and will always remain in his original state of ignorance."

198. Copies.—Much copying must be condemned when done for exhibition in place of nature study, but a little copying is desirable after some ability to do original work has been gained. Copying straight and curved lines, geometric forms and historic ornament in outline should be part of the work in every grade until perfect results are gained.

After students have drawn from circles, a few copies of perfect ellipses may be drawn. After drawing any solid, as the cube or cylinder in many positions, copies of perfect outlines of the solid may be made. A copy of a charcoal drawing, or one in water-color monochrome may be made after several have been drawn from nature. In the same way a copy in color may be reproduced in color, after some study from nature in color.

It is better to omit all copies except those in outline unless

* "Training the Memory in Art," by L. De Boisbaudran.

the reproductions are good, and from originals whose technique is satisfactory. Many examples for copying are of the worst possible technique, and before making use of printed copies they should be proven good.

199. Apparent Technique is Bad.—The test of good technique is given by the question—does it make you think of nature or of the medium, or its technique? A good picture tells its story without any thought of its handling. Any picture which causes you to think first of its technique is bad. To select prints in values or color for copies use the lenses as explained in Sections 73 to 78, first setting up the group represented in the proper light.

It is not necessary to do this in the case of many prints which at a glance make you realize that their technique was the chief thought of the draftsman who made the original. Thus for many years the fact that the line plate must be made from a drawing composed of separate lines rather than of tones, has led to the publishing of prints in which the lines of shading are so far apart and so mechanical and false as to be absurd. The student should avoid all questions of process and special technique until his eyes are true for form, values, and color.

200. All Should Study Drawing.—It is a mistake to believe that drawing will benefit only the few who are to use it professionally, for, more than any other study, it develops the perception and the reason and increases brain power, but of greater value is the spiritual growth that comes from honest art study. The artist feels that life has more beauty and happiness for him than for the majority who are not able to see beauty or experience the pleasure of embodying thought and action in their work. Education should relate not alone to the material but in some degree at least to the spiritual, that we may avoid the narrowness due to specializing and technical training. Every student should have at least the elements of a liberal education, and drawing should be as generally studied as is music.

Michael Angelo gave the reason why drawing should be studied by all in the old-fashioned, honest way long superseded by dishonest methods, when he said:—"Nothing makes the soul so pure, so religious, as the endeavor to create something perfect: for God is perfection, and whoever strives for it strives for something that is God-like. True painting is only an image of God's perfection,—a shadow of the pencil with which he paints, a melody, a striving after harmony."

I do not disagree with the effort to teach Art and Design in the Grammar School, but with the neglect of object drawing. These subjects are of equal importance and can be studied with equal value, for the Glass makes object drawing possible and in-

teresting in even the lower grades. Design and drawing should be studied together, for each aids the other, and art requires design just as much as design must be based on drawing.

The Boston Art Club recently extended an invitation to New England school-children of fourteen and under, to send in drawings for an exhibition of children's work.

I was fortunate to see not only the six hundred accepted drawings, but the much larger number not hung for lack of space. The exhibition will be open while this book is in press and should prove interesting to all teachers.

Some teachers do not believe in memory drawing or the study of composition before one has learned to draw and paint. This exhibition should cause reconsideration of such an opinion, because many of the drawings show remarkable ability in design and color, and are far better in these respects than much work by art-school students and even by artists.

But the exhibition proves that today, to the pupils of our schools, drawing does not mean study of appearances, for it is difficult to find solitary examples that suggest that object drawing is ever attempted. Probably 95% of these drawings illustrate such subjects as the following taken at random from the drawings: "Cinderella at the Ball," "Jack and Jill," "Mary had a little lamb," etc.

Formerly drawing meant copying appearances with no attempt at memory or illustrative work, and this exhibition represents the natural reaction from a mechanical effort to represent appearances.

By usual methods there has not been time for pupils to develop their memory and imagination, and also their eyes; therefore instruction has been narrow. Rightly used the Glass enables true vision and artistic expression to be developed at the same time.

Memory drawings made on the Glass develop surprising power to illustrate on paper without study of the model. Grade pupils who follow the lessons of Chap. IX should be encouraged to use all possible time in memory study on the Glass. The best students may find time at the end of each exercise while the rest of the class are trying to complete the work. But if time can be found, extra lessons should be given the entire class on memory drawing on the Glass.

Chapter VIII.

MODEL DRAWING IN THE GRADES.

Copyrighted by Evelyn F. Cross, Supervisor of Drawing, Stoneham, Mass.

201. Art School Methods Fail in Low Grades.—The failure of the "Cross" Drawing Glass in many grade schools has made me decide to publish these lessons. The Glass was first used in Art Schools, and when adopted by public schools, it was natural to follow the methods which had produced such remarkable results in Art Schools.

When I first used the Glass in Grammar Grades, I did not dream that there was any way except the Art School method, and I became so disgusted with the results that I gave up all use of the Glass and could not be persuaded to try it again for several years.

202. Finally I tried again and found that by use of models on each desk, the upper grades could do good work. Now, after several years of experiments, I am satisfied that I have found a way to begin in the lower grades that will interest the pupils and enable them to succeed.

Supervisors who have seen my classes at work have copied the directions given to my grade teachers and have afterwards written to say that these directions made drawing from objects so profitable that they should be printed for general use.

No course of study should be given teachers until it has first been carefully worked out in the class-room. Theories are theories,—and children are children. Sometimes the theories and the children can be brought together harmoniously, but more often some change is required, and since the children cannot be changed, the theories must be adapted to their minds.

I do not claim to have a course that will never need changes, for several times in the past few years, I have thought that I was ready to publish my plans, and then some experiment has given me a new and better method, and I have waited to make sure of details. I expect to change in the future, as in the past, but I feel sure of the most important problems.

203. Teachers who use these lessons must not expect to avoid all difficulties, for the children cannot help being awkward at first, but those that persevere are sure to find the pupils interested

FOURTH GRADE PUPILS DRAWING

WORKING DIRECTLY ON PAPER

THE GLASS USED AS A FINDER ONLY

THE "CROSS" CRAYON NOT USED

FIG. 75.—From photograph.

FROM DR. CHARLES W. ELIOT, PRESIDENT EMERITUS HARVARD UNIVERSITY.

DEAR MR. CROSS:—Your Glass is a very simple and ingenious device for training the eye to see with precision. *It ought to be used in all the drawing classes in the country;* for it enables the pupil himself to prove how exact his own observation of an object placed before him has been. It is not necessary for the teacher to show the pupil that his work is exact or inexact. The pupil himself can prove the quality of his own work; and so see how to correct it. Your Glass helps him to tell with his pencil the matter-of-fact truth, and to set down accurately what he sees with accuracy. Of course the delineation of an object is only a part of drawing; but it is an essential part.

I wish every superintendent of schools in the country could see for himself how rapidly pupils—both in the grades and in the high school—that use your Glasses advance in skill and in self-reliance.

As I am hoping that drawing is to have a much larger place in American schools than it has ever had before, I naturally take strong interest in all means of improving the teaching of drawing. Your Glass is plainly a great improvement in teaching correct delineation of objects and perspective.

GRADE IV.

Drawn Directly On Paper.

Though these pupils are too young to draw on the Glass and test by looking through the Glass at the object, *they can draw on paper*. See Fig. 75.

All who see these busy children happy in their self-instruction, and in a concentrated effort that produces a wonderfully successful class result, admit the great value of this drawing in the Grammar School.

A Fourth Grade Teacher said—"*My pupils want to draw all the time and gain concentration that aids in other studies.*"

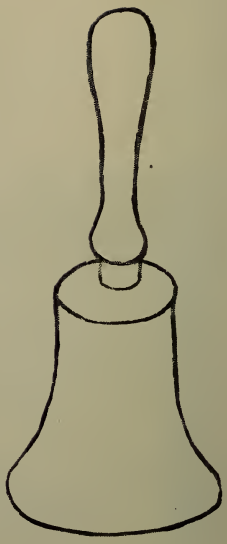


FIG. 76.—Such results come from the use of the Glass as a finder (as shown by Fig. 75), the "Cross" crayon not being used.

in an unusual degree as soon as they discover that they are able to criticise their own work.

204. Glass Saves Paper.—The supervisor who meets with objections as to the expense of providing schools with the Glasses has only to state that the pupils work so much upon the Glass that very little drawing paper is used for some time and that the saving of expense for paper soon balances the cost of the Glasses. It has, however, been my good fortune always to work under school committees who, once convinced that the success of my work depended upon the purchase of certain equipment, were ready to provide the materials.

205. All Grades Begin in Same Way.—The lessons for the higher grades can not be given to pupils not prepared for them by several years' use of the Glass in lower grades or by later study of the lower grade lessons. This preparation must be thorough, for a quick review will do little good. Perspective is hard to understand and apply, even with the aid of the Glass. Only conscientious effort and more time than is ordinarily given to object drawing can render the Glass as helpful as we have found it in Stoneham, where the teachers who have carried out these experiments are conscientious workers and so faithful in following directions that the success is as much theirs as mine.

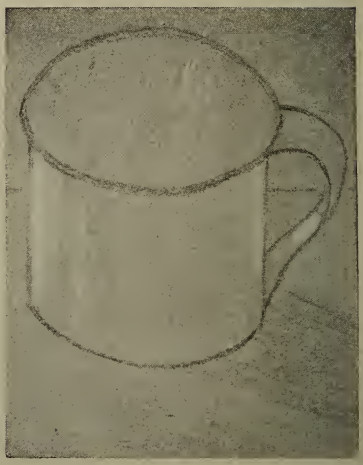
206. Success Demands Time.—A grade teacher unable to follow directions carefully or unwilling to work long and hard with models that do not make good exhibition subjects, will fail with the Glass. Any supervisor should succeed, provided she is allowed sufficient time for the subject, but failure is certain without the needed time.

Some supervisors are bound to meet with objections because model drawing takes so much time. It has been my privilege to work with superintendents who have had the vision to realize that the removal of model drawing from the course of study meant the removal of the very foundation of the art course and who, therefore, were glad to permit plenty of time for experiments with the Glass.

207. I am especially indebted to Mr. Arthur Webber, who until recently has been superintendent of the Stoneham Schools. My present superintendent, Mr. Frederick Porter, expresses himself as follows: "I am much impressed with the new method of teaching free-hand drawing which I have seen demonstrated in your classes. The ability of the pupil to correct his own errors renders it invaluable and the results are so uniformly good in both higher and lower grades that I feel convinced that sometime the "Cross" Glass must come to be recognized as the only

"The Glass is going to be an enormous help in making even the dullest see. *You have lightened the burden for all drawing teachers.*"—H. B. WARREN, *Harvard University.*

"*It is the best aid to observation I have seen,* being direct, sensible and simple. The results from its use are remarkable."—C. HOWARD WALKER, *Director School of Design, Architect, Boston.*



"One could not believe such results possible, unless he saw the actual work both at the beginning of the term and now. *The Glass will be a missionary to rural sections.*"—CHARLES E. VARNEY, *Supt. of Schools, Gray, Maine.*

"After investigating carefully your Drawing Glass, I have decided to introduce it in the free-hand drawing classes in this School. *For a Drawing Teacher not to use the 'Cross' Glass would be as foolish as for a semi-blind man not to wear glasses.*" "I went into a class last evening and said to the instructor, 'Well, how does the Glass work?' 'Fine,' said he. 'I will have to change my course. *They have learned more in a week with the Glass than formerly they did in a month.*'"—F. F. FREDERICK, *Director of the Trenton School of Art.*

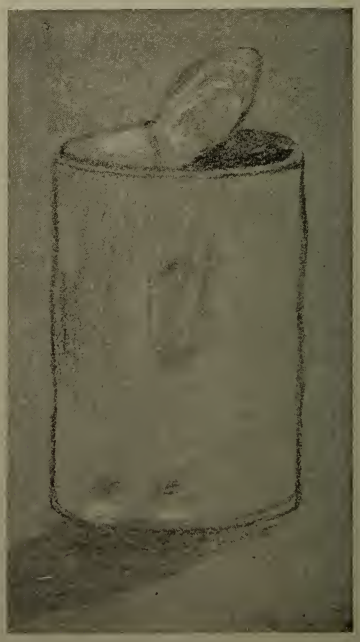


FIG. 77.

sensible way of bringing before the pupil the principles of perspective."

208. Tracing Starts Pupil.—When the Glass is used in Art Schools, no tracing is permitted, but time is wasted unless some tracing is allowed in public schools. The average public school pupil has no idea as to what he is to look for while studying and almost no knowledge of perspective. Thus a little time spent in judicious tracing will open his eyes much more rapidly than will the Art School method of drawing by sight on the Glass with the "Cross" crayon, testing, correcting, etc. Without this tracing, the grade pupil can not understand that a correct drawing necessitates lines on the Glass that appear to cover the edges of the object when the Glass is held in position for testing. A little tracing at the beginning should be permitted, but it should not continue after it is possible to work without it.

209. Study on Glass.—In Art Schools the students are ready to work on paper when they can make on the Glass a drawing which will fit at first trial. The average public school pupil can not be expected to make drawings which will perfectly cover the object at first trial, but many pupils will succeed in making their drawings *nearly* cover at first testing. This does not, however, prove that they are ready for work on paper,—in fact, my pupils failed entirely when given the paper. I felt that there must be some way to manage the change from Glass to paper, and I tried using the Glass simply for study. I could not at first see why it should make the difference, but I had taught long enough to realize that things which make little difference to adults make a world of difference to young people. It proved so in this instance. The "Cross" crayons were not distributed, for we did not wish to give a chance for tracing. The pupils studied the models through the Glasses by laying on pencils to test directions of lines and by "making believe" draw the outlines on the Glass with lead pencils, and they readily put the results of that study upon paper.

210. As the weeks passed and proved how much better and more quickly the pupils were drawing, I concluded to use the Glass for study before attempting to draw on the Glass with the "Cross" crayon. Preliminary study *through* the Glass enables the pupil to avoid making many mistakes and is one of the most helpful ways of using the Glass. This study is merely what a student does when he draws "in the air." But studying "in the air" by a young pupil is so inaccurate that it is without value,—while study *on* the Glass or *through* the Glass confines the pencil to one plane surface and serves to convince the

pupil that drawing does not result from guesswork but from knowing how to observe.

Since last fall, our fourth grade pupils have done more remarkable work (considering their age) than those in more advanced grades. At first I tried the method explained in Lesson 6, Grade IV, in one room only. The results were so much better than any gained in even Grade V or VI that I said, "This must be an exceptional class. I cannot expect it again." Then I tried it in a second fourth grade. This also was an exceptional room. I kept on trying it until every fourth grade in town had proved itself exceptional, and then decided that it was the new way of using the Glass. One might conclude that the fourth grade teachers were all exceptional, but the same teachers, under my supervision, had used the Glass differently and attained results only fairly good.

211. Directions Avoid Failure.—It may seem unnecessary to follow all the directions closely, but it is far wiser to do so, for they are the result of several years of effort, in most of which little or no success was gained, while these directions have resulted in uniform success for all who have followed them carefully. Sometimes a slight difference in use, so slight as to seem hardly worthy of mention, will yet mean the difference between success and failure. These differences mean more to the pupil of lower grades than to those of higher grades. We often tell our classes that learning to draw is simply learning to see, but all the time we are well aware that teaching pupils to see is the most difficult of all our problems and that the younger the pupil, the more difficult has perspective proven, so that at times it has seemed an impossible task. I have long felt helpless and hopeless concerning model drawing. It is true that I always had a few talented pupils who could learn to apply the principles of perspective, which the others could not be induced to do.

212. My experience is by no means exceptional. For many years drawing teachers have faithfully tried to teach object drawing and failed completely except with the talented few. Now, when so much attractive work is expected from the art department, it is no wonder that directors believe that the public cannot realize that correct drawings of the cube, prism, and cylinder are worthy of admiration. They make no show, and it takes so long to obtain the drawings that there is not enough time to produce also the showy subjects which appeal to the fancy of the spectator.

213. The drawing teacher has thus been forced to neglect the fundamentals and omit object drawing, first from the lower grades, then from the higher grades, until now so little real draw-

Fig. 78.—From sketch by Anna M. Hathaway.

ing is taught in many places that when demands for posters and other decorative work are made, it is necessary either to avoid subjects that involve perspective or to assist pupils to an extent that renders the results more the work of the teacher than of the pupils. Only a few months ago a supervisor of an important city came to me in despair and said, "I don't know what to do. I begin to think I must give up teaching. I do not have time to teach principles and my pupils are so poorly prepared for the show work which I am forced to give them that they are unable to do anything without altogether too much assistance from me."

214. Art and other educators recognize that a most important factor in art study is that training of the judgment which gives keen vision and ability to do accurate work of any kind. Model and object drawing does more to further this end than any other subject included in the drawing course. This fact is quite generally recognized now, and so the drawing teacher must be interested in a method which promises successful class results with model drawing, even in the lower grades of public schools, for, as is well known, it has been considered unwise, if not impossible, to expect class results in this subject below the High School.

In addition to the exercises I have planned, I would suggest that all the students try to reproduce from memory the drawings which they have correctly made on the Glass. The objects should be removed while making these drawings and replaced that the completed work may be tested.

NATURE DRAWING.

Since the Glass is as useful in nature drawing as for study of perspective, it will be well to give a few general directions.

215. Trace Leaves.—Begin with single large leaves, *e.g.* lilac, plantain, syringa, maple, oak, etc. Place the leaf straight ahead at the farther part of pupil's desk and with midrib parallel with short edges of desk. Pupil look with one eye toward center of leaf and place Glass in position for tracing and as near leaf as possible without hiding leaf by lower side of frame. Trace line on Glass with "Cross" crayon to cover midrib and stem of leaf and then trace outline of leaf,—all the time looking back to see if the first line traced still covers, for if either the Glass or the eye is moved the tracing will not be a true picture.

The foreshortening is so great a surprise that the pupils are at once interested. After tracing has been completed, place the leaf behind the tracing so that differences may be better observed.

216. Study Through Glass.—When several tracings of leaves

have been made, pupils may study through Glass and draw on paper or study through Glass and draw by sight on Glass with "Cross" crayon. At first draw simply the mid-vein and stem of the leaf (so placed that mid-vein is parallel with short edges of desk), then hold Glass in position for testing and see if this is correct. Also study outlines of leaf through Glass, "making believe" draw by lead pencil tracing. Next draw by sight on Glass with "Cross" crayon and when outline is completed, hold up Glass and look through it at leaf to see if lines can be made to cover outline of leaf. If not, note errors, lay Glass down and correct, test again, etc.

217. When ready for work on paper, study leaf through Glass by "making believe" draw its outline with lead pencil. After having thus felt the way around on Glass, feel the way around on paper and finally sketch with lead pencil.

218. Sprays.—When able to draw single leaves of simple shapes, more difficult leaves may be studied and later sprays of simple leaves and finally more difficult sprays.

The Glass thus used has been a wonderful help and has enabled most of the pupils in a class to make good drawings. Before such use of the Glass, the majority persisted in making "plans" of leaves and were helpless to draw a leaf placed in a peculiar position. Now, the greater number of drawings show foreshortening, and pupils seldom ask how to represent unusual positions. If they do not know at first glance, they understand how to study and discover for themselves. Teachers are enthusiastic in the use of the Glass for nature study and often attempt and succeed with more difficult subjects than I have given in my outlines.

When the pupils discover that the pictures are really pleasing and that they can teach themselves to produce them, they are delighted to draw appearances instead of facts.

219. Foreshortening.—A supervisor who visited our classes questioned the pupils of a sixth grade about the drawings, which were uniformly shorter than the models. He picked up a model, measured it and then measured the drawing and asked why the drawing was so much shorter than the model. A pupil replied at once, "Because of foreshortening."

"Foreshortening," said the supervisor, with a puzzled expression. "What in the world is that? I know that shortening is something put into bread. Is it anything like that?"

"No," replied the boy. "Shortening is something you put into bread to make it taste good and foreshortening is something you put into drawings to make them look good."

Was there ever a better definition! And we firmly believe

Fig. 79.—By Anna M. Hathaway. Pencils used, H., F., 3B, 6B.

that the mission of the "Cross" Glass is to give the average pupil ability to make a drawing "look good,"—an ability which will sometime make drawing the simplest, practical, universal language.

Grade VIII. Brush drawings.

Chapter IX.

LESSONS FOR GRADED SCHOOLS.*

GRADE IV.

THE FIRST LESSONS ON THE GLASS.

Lesson 1. Pupils learn to look with only one eye.

Pupils learn to aim a pencil at point on blackboard.

Pupil learns to aim a pencil at point on his own desk.

Pupils learn to follow with pencil point in the air, a straight line on blackboard. (Teacher use pointer as guide.)

Lesson 2. Pupils mark a point (shown by an x) in center of paper 6″ x 9″. Place paper at back of desk. Look through Glass at this point. Practice in sighting or aiming at and covering this point with point of a lead pencil placed on the Glass. Look with one eye and then with the other eye. Sit high and then sit low and note how the position of pencil point on Glass changes in order to cover the point on paper.

Lesson 3. Practice in following curved line on board. Teacher guide pointer slowly around a circle and pupils follow pointer by drawing in air with pencil.

Pupil lay a circular card (5½″ diam.) straight ahead at farther part of desk. Hold Glass in position, look through it at circle and then trace circle with "Cross" crayon. Several attempts will be necessary to obtain an accurate tracing.

Lesson 4. Pupil trace with "Cross" crayon a circular card (3½″ diam.) placed on the end of a cylinder made by rolling up a strip of paper 5¾″ x 12″. The card should fit the top closely and a second card of same diameter should be cut for the bottom. A few experiments will determine how much lap to allow. After tracing the top circle on the Glass with "Cross" crayon, remove the top, also the central part of the model, but leave the lower circle. Then trace lower circle and compare tracings of top and bottom.

Bring out idea that the lower the circle, the wider it appears from front to back.

Lesson 5. Trace with "Cross" crayon the entire cylinder made as described above. Note that lower circle appears the

* Copyrighted by Evelyn F. Cross.

Fig. 80.—By Anna M. Hathaway. Pencils used, H., 2B, 3B, 6B.

wider ellipse. Pupils see all the circle at the top and only part of the lower one and so think the lower ellipse is not as deep as the upper. A knitting needle laid across the Glass horizontally and seeming to extend from the lowest point in the left vertical to the lowest point in the right vertical will convince them of the appearance. Sometimes it is necessary to use this needle even when tracing, as pupils refuse to believe their eyes and insist on drawing the lower ellipse not deep enough.

Lesson 6. First lesson in studying through the Glass. Do not distribute "Cross" crayons.

The same cylinder vertical at the back of desk. Study vertical side lines by placing two pencils on Glass. The convergence of these verticals will seldom be noticed. Say nothing about it unless some pupil speaks of it. Then explain that if convergence is shown, the drawing will look like a tumbler instead of the cylinder, and thus vertical edges must always be shown by vertical lines. Explain that the lines do really appear to come together and that this is the only time that we do not draw exactly what we see when representing a single object.

Study top of cylinder by tracing on Glass with lead pencil the curve of upper circle. Study bottom by tracing with lead pencil.

This "feeling the way around" the contour is a wonderful help. As there is no drawing on the Glass, there is no tracing that can be copied. If pupils trace and copy the tracing, they do not think, and such use of the Glass is worthless.

The few tracings needed at the start should, however, be followed with much study and close observation, or the power of seeing truly will never be gained.

Lesson 7. First Lesson on Paper.

Pupils study through Glass (see Lesson 6). After study of model as a whole, study top circle by "feeling way around" on Glass. Then feel way around on paper, and after this, sketch lightly on paper the top ellipse. Carefully study side lines by use of knitting needle (see L. 5), then sketch lightly. Then study and sketch lightly bottom of cylinder.

To test drawing, place pencil horizontal across Glass and measure the width of model. Place this width on drawing. Place pencil flat on Glass, parallel with sides of frame, and set off height of model. Compare with height of drawing. Sometimes in first lessons in Grade 4, it may be well to have pupils measure height and width on Glass and transfer to paper before drawing. Such aid is allowable for young children, but after a few lessons, they can draw first and then measure.

Lessons 8, 9, 10 and 11.—All kinds of interesting models based on the cylinder.

The models need not be alike, for it is better for pupils to use their own objects and bring tin cans, tumblers, flower pots, tin dishes with handles, powder cans, ink fillers, all kinds of bells, vases, cups, mugs, etc. These objects will answer for several lessons, as pupils may exchange models. In this way models for each student are readily supplied. No attempt at finish except neatness and a soft gray line.

Pupils of Grade IV. should make many drawings on paper so that they may understand how to draw any object based on the cylinder or slight variations of this form.

This may seem a hard problem for Grade 4, but the suggestions given make it possible.

GRADE V.

Lesson 1. Practice on use of Glass.

Practice looking with one eye.

Practice in covering ruler held vertically at front of room. Pupils use ruler or pencil at arm's length and measure upon it. Repeat when pupil holds the ruler nearer his eye. Note different distances taken to cover the ruler at front of the room. Cover and measure other and longer edges in room, as an edge of a picture, or top of door or blackboard.

Place a bit of paper at back of pupil's desk and aim at it with ruler. Aim first without Glass, then with Glass in position for looking through it at the paper. Aim carefully at paper and see where ruler strikes Glass. Aim with right eye, then with left eye. Sit high and aim. Sit low and aim. Note that ruler strikes Glass at a different point each time the position of eye is changed.

Explain carefully correct use of Glass. Show need for keeping eye in one position when drawing or tracing, by making two tracings of a pupil's head, the first from one fixed point being the good picture, and the other an absurdity produced by moving the eye while tracing the head.

Lesson 2. Place pencil in groove at back of desk. Place thumbs on Glass to cover ends of pencil. (Glass can be held in position with the fingers.) Place pencil on Glass to cover pencil behind Glass. Place pencil on desk parallel with short edge of desk. Hold a pencil against Glass to cover the pencil on desk. Note difference in length of the pencil on desk and the part of pencil (on the Glass) that covers it.

(*a*) Study last position when eye is in line with pencil.

(*b*) Study last position when eye is at right of pencil.

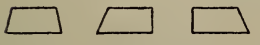
(*c*) Study last position when eye is at left of pencil.

Fig. 81.—From pencil drawing by Anna M. Hathaway.

If new pencils of same length are used, this study will be most successful.

Place square card ($7\frac{3}{4}''$) at back of desk and place pencils on Glass to cover front and rear edges of card. Study foreshortening. Same experiment with oblong ($5\frac{1}{2}''$ x $8''$), first when its long edges are parallel with long edges of desk, and then when the short edges are parallel. (Glass may be held with short edge on desk for last position.) Study foreshortening and explain common examples.

Lesson 3. Convergence.—Square card, $8''$. Place pencils on glass to cover side edges of card and note convergence. Study three positions. First, eye looking toward center, then in line with right edge of card, and last in line with left edge.



Same experiments with oblong $5\frac{1}{2}''$ x $8''$.

Same experiments with square $4\frac{1}{2}''$.

Lesson 4. Tracing.—Teacher draw line on blackboard. Class follow teacher's pointer with lead pencil as she starts at top and goes slowly downward. Other lines then followed. Continue "drawing in air" by following pointer around the sides of a large square drawn on blackboard.

Place square of $7\frac{3}{4}''$ straight ahead at back of desk. Look through Glass at it and trace with "Cross" crayon on Glass:—first, when looking toward center; second, when eye is in line with right side, and third when in line with left side. In the last two positions, one side of square will be covered by one edge of the frame.

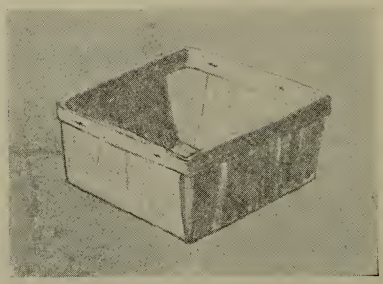
In similar manner trace with "Cross" crayon an oblong $5\frac{1}{2}''$ x $8''$.

Lesson 5. Trace with "Cross" crayon cube $2\frac{3}{4}''$. Trace when only two faces are seen. Note foreshortening of top, also of front face and convergence of edges of top. Erase tracing and study cube through Glass without tracing. Place two pencils horizontally across Glass to cover nearer and farther edges of top face and note that distance between pencils is the distance that top appears from front to back.

Place two pencils across Glass to cover upper and lower edges of front vertical face. Note that distance between pencils is apparent height of front face.

Place two pencils on Glass parallel to side edges of frame and so that they cover the nearer ends of two side edges of top face. Move pencils together at the top until they cover side edges and note their convergence.

Lesson 6. Drawing by sight on Glass with "Cross" crayon. Draw cube with two faces visible.



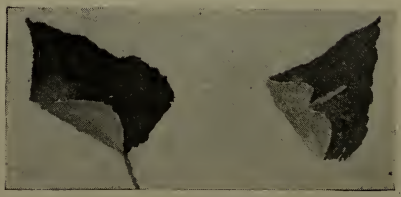


FIG. 82.—Brush drawings from nature. Grade VI.

220. Before drawing by sight it is necessary for most pupils to study through the Glass. The laying on of pencils to cover edges, even the tracing of outlines with a *lead* pencil is permitted. It should be remembered, however, that there is a great difference between lead pencil tracing on the Glass and tracing with "Cross" crayon. The latter makes an actual outline, and if the pupils trace thus on the Glass before drawing by sight, they will simply erase the tracing and draw it again by memory without any thought whatever, or they will make sure of leaving faint outlines though pretending to erase and so get rid of the necessity of even memory work. The lead pencil tracing teaches them to think, and as it leaves no line on the Glass, is the best possible way of studying. All study *through* the Glass done as an aid to the drawing by sight on Glass with "Cross" crayon should be done at *one* time and before drawing even one line with crayon. The pupils should simply hold up Glass and do all such studying in a few minutes and then lay Glass down and keep it flat on desk while drawing with crayon by sight. The study through the Glass as done in connection with the *first* drawing on paper permits study of one line at a time. The various ways of using the Glass tend to make it possible sometime to do wholly without it.

221. Art School students should draw on the Glass when it is held in the hand at right angles to line of vision, but young pupils must place it flat on the desk with the white card behind Glass. When drawing is finished, lay crayon down and hold Glass in position for testing and look through Glass at cube. See if Glass can be held so that the drawing will cover the edges of cube. If not, note mistakes, lay Glass down and correct. Look through Glass again, note mistakes and correct as before, and so continue until all lines can be made to cover.

No tracing for corrections should be permitted when drawing by sight.

Lesson 7. Square Prism, 2½″ x 2½″ x 5″, two faces visible. Draw by sight with "Cross" crayon on Glass. Proceed as in case of cube, L. 6, the prism being upright.

The prism, lying down, only two faces visible. Two positions, the first on desk and the second on three or four books. Draw by sight on Glass. When testing, Glass should rest on desk or on the pile of books.

Lesson 8. On Paper. Do not distribute crayons. Study cube, 2 faces visible, through Glass. Place pencils on glass to cover edges, etc., etc.

Place drawing paper so that when Glass is in position for study, the lower edge of frame can rest on farther edge of paper

to hold it. Pupils "feel way" around on Glass with lead pencil, then "feel way" around on paper. Sketch lightly on paper with pencil of medium grade. Place pencil across Glass and set off on pencil the width of cube. Compare this with drawing. Place pencil upright on Glass and measure on it the height of cube. Compare with drawing. Place two pencils on Glass to measure convergence of top edges. Compare with drawing and correct same. Erase mistakes and finish in soft gray lines.

Lesson 9. Square Prism on Paper. Do not distribute "Cross" crayons.

Two positions,—first, upright with two faces visible, and second, lying down with two faces visible.

Proceed as in L. 8.

Draw square plinth 4″ x 4″ x 1⅜″ on paper, two faces visible.

Lesson 10. Boxes on Paper.

Proceed as in L. 8. Do not give out crayons.

Other subjects of a more interesting nature should now be studied. Vegetables and fruits make good subjects. Cylindrical objects should be reviewed. Each pupil must have a model on his own desk. Pupils may draw on Glass by sight with "Cross" crayon before they draw on paper.

GRADE VI.

Lesson 1. Tracing.—The Cube, three faces visible.

Place cube so that the two side faces appear of equal width. Sit so as to look with one eye toward center of cube. Hold a string, weighted by eraser, as a plumb-line to appear to pass through corner G and the edge A B. Fig. 84.

Trace cube on Glass with "Cross" crayon. Constantly refer to first line traced to see that it covers the edge. Study tracing to understand why the cube appears thus.

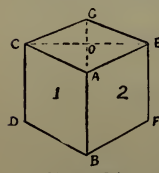


Fig. 84.

A. Each pupil draw on Glass a line connecting D and F. Note its horizontal direction and that the bottom edges slant upward at equal angles. Measure on straight strip of paper (ruler is useless) the distance from middle vertical to D and compare with distance to F. Note that distances are equal and therefore side faces 1 and 2 appear alike.

B. Measure middle vertical A B of tracing on strip of paper. Compare with actual length of edge A B in model. A B appears shorter than its real length because, being below the eye, it is seen obliquely and foreshortened.

C. Measure length of C D in tracing and compare with A B.

FIG. 83.—Grade VI. Brush drawings from nature.

Explain that C D appears shorter than A B because it is farther away. Measure E F and see that it is the same length as C D because the same distance from the eye.

D. Draw diagonals in the tracing of the top face and note that C and E are in the same horizontal line, while A and G are in the same vertical line. Measure A O of vertical diagonal and compare with O G. Explain that A O appears longer because nearer eye.

E. Place ruler on B F of tracing and continue it. Also continue A E and C G. These lines come nearer together in the tracing as they recede. Make same experiments with left side lines of tracing.

If any pupils notice the convergence of the lines of tracing that represent the vertical edges of cube, explain why this is not represented. (See L. 6, Grade IV.)

Lesson 2. Tracing Square Prism on Glass. Place prism so that two side faces appear equal. Trace with "Cross" crayon. Study tracing as explained in L. 1.

Lesson 3. Study Cube through Glass. Draw on paper.

Do not distribute "Cross" crayons.

Place cube at farther part of desk with three faces visible, the two side ones equally foreshortened.

Place paper so that when Glass is in position for looking through it at model, the frame will rest on farther edge of paper to keep it in position.

Pupils look through Glass at model and study angle of lower edges. Place two pencils on Glass to cover these edges. Place knitting needle across Glass from D to F (Fig. 84). Note how far up needle seems to cut middle vertical. Sketch on paper with lead pencil the lower edges of cube. Also the middle vertical. Place knitting needle upon drawing to see if lines are at correct angle. Measure on Glass the apparent length of middle vertical and compare with drawing.

Place two pencils on Glass to cover edges A E and B F. Note convergence. Sketch on paper and test. Lay two pencils on Glass to cover A C and B D. Note convergence. Sketch on paper and test.

Sketch side verticals, then measure width of side faces both on Glass and in drawing.

Place pencils on Glass to cover edges of top, A E and C G, also A C and G E. Sketch on paper. Draw horizontal and vertical diagonals of top. Place knitting needle on Glass to form horizontal diagonal of top and compare with drawing.

A O appears a trifle longer than G O through the Glass and should be so in the drawing.

Fig. 86.—Brush drawings from nature. Grade VIII.

After all corrections are made, erase and finish in soft, gray lines.

Lesson 4. Study through Glass. Draw on paper. Crayons not distributed.

Place square prism 2½″ x 5″ upright, at back of desk, with three faces visible, the side faces equally.

Proceed as in preceding lesson.

Lesson 5. Study through Glass. Draw on paper. The square plinth (4″ x 4″ x 1⅜″), three faces visible, the two side faces showing equally. Proceed as in L. 3.

Lesson 6. Draw on Glass by Sight with "Cross" crayon.

Place cube at back of desk on pile of books, with three faces visible, the two side faces equally.

Draw on Glass directly without tracing. Study through Glass, if necessary. Place Glass flat on desk with cardboard behind Glass. When completed hold Glass in position for testing, resting it on books instead of on desk, and see if all lines of drawing can be made to cover at one time the edges of the cube. Note errors, lay Glass down, and correct, etc., etc.

Lesson 7. Draw on Glass by Sight.

The square prism upright with three faces visible as in L. 6. Place on books.

Lesson 8. Draw on Glass by Sight.

The square plinth when placed on books, three faces visible.

Lesson 9. Draw on Paper. Boxes.

Do not distribute crayons. Use objects based on square prism or plinth.

Lesson 10. Draw on Paper. Cube.

Three faces visible, two sides equally. Draw on paper, if possible without study through Glass.

Lesson 11. On Paper. Square Prism.

In same way as in L. 10.

Lesson 12. On Paper. Object (not a box) based on Square Prism.

If possible, without study through Glass before drawing.

222. It may seem as if I have planned an unnecessary amount of drawing on Glass by sight, but I have tried less and failed. Drawing by sight on Glass and then testing seems to be the only way to obtain an exact drawing. This trains pupils' judgment so that finally they can work readily on paper. Some will wonder why they begin by studying through the Glass and drawing on paper, and then leave the paper to draw by sight with "Cross" crayon on the Glass. It is because, in the lower grades, it is easier for them to make an approximately correct drawing on paper after study through the Glass, than it is to

make and test an exact drawing on the Glass. Making the approximate drawing on paper prepares the way for the absolute accuracy demanded by the drawing on Glass.

Some may think the study through the Glass not essential and that pupils should work directly on paper. I have found much time wasted when difficult subjects are thus tried by young pupils. The study through the Glass makes real the truth that the drawing on paper must be exactly as model looks through the Glass. High School and advanced pupils may not need this study, but after ten years of teaching without it and one year with it, my teachers are convinced that studying first through the Glass makes subjects possible that have hitherto been considered impossible. I believe that, when all my classes have from the beginning been trained as these lessons suggest, the final results will be much better than those now attained.

GRADE VII.

Lesson 1. Tracing Cube.

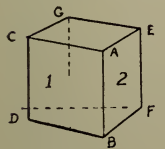


FIG. 85.

Place cube so right side appears narrower than left and trace on Glass with "Cross" crayon. Look with one eye directly toward center of cube. If position of model is correct, a plumb-line held to appear to cover corner G will intersect line A C. Fig. 85.

While tracing, refer to first line traced to see that it still covers. Study tracing.

A. Pupil draw on Glass horizontal line through F and note that it cuts left vertical C D above D. When the sides are at unequal angles, D and F will not be in horizontal line.

When the angles of D B and B F are unequal, the sides 1 and 2 will appear unequal. Measure with strip of paper on horizontal line through F the width of right side and compare this width with that of left side. Note that the narrower face has the greater angle (B F).

B. Measure middle vertical A B of tracing and compare A B in tracing with A B in cube. Note that appearance is shorter than real length because below the level of eye.

C. Measure C D in tracing and compare with A B. Bring out idea that C D is farther away than middle vertical and therefore appears shorter. Measure E F and compare with C D. Note that E F is a trifle shorter because farther back.

D. Place rulers on three lines of tracing that converge to the left. Note convergence. Place rulers on three lines that converge at right.

Fig. 87.—Grade IX. From mounted specimens.

Lesson 2. Tracing Square Prism.

Place object so that the side faces appear of unequal width. Trace on Glass with "Cross" crayon and study tracing as explained in preceding lesson.

Lesson 3. Study through Glass. Draw on Paper. Do not distribute crayons.

Place cube on desk so that three faces are seen, the right appearing narrower than the left. Fig. 85.

Place paper so that when Glass is in position for studying model, the frame may rest on paper to hold it in place.

Pupils look through Glass at cube, study angles of lower edges and place two pencils on Glass to cover these edges. Place knitting needle horizontally across Glass through F. Note where needle seems to cut middle vertical and the left vertical.

Sketch middle vertical line of drawing. Measure its apparent length on Glass and compare with real length and with the drawing.

Place two pencils on Glass to cover edges A E and B F. Note convergence and sketch on paper.

Place two pencils on Glass to cover edges A C and B D. Note convergence and sketch on paper.

Draw side verticals and then measure width of each side face and compare with the sketch on paper.

Place pencils on Glass to cover edges of top A E and C G and then to cover A C and G E. Sketch on paper, correct and finish with soft, gray line.

Lesson 4. Study through Glass. Draw on Paper.

Place square prism upright, at back of desk, with two sides showing unequally.

Proceed as in preceding lesson and do not trace at all.

Lesson 5. Study through Glass. Draw on Paper.

Place square plinth at back of desk with its sides showing unequally.

Proceed as with cube, L. 3.

Lesson 6. Draw Cube on Glass by Sight.

If necessary, study first through Glass (see Lesson 6, Grade V.).

Place on books at back of desk and with side faces showing unequally.

Draw on Glass with "Cross" crayon. Have Glass flat on desk with the cover behind it. Do not trace.

When completed, hold Glass in position for testing, resting it on the books instead of on the desk. Look through it at cube to see if all lines of drawing can be made to cover at one time all edges of the cube. Note mistakes and lay Glass down and correct. Look through again and test and correct, but not by tracing.

Lesson 7. Square Prism. On Glass by Sight.

Place prism upright on books at back of desk, with side faces unequally seen. Place higher than cube in L. 6.

Proceed as in last lesson.

Lesson 8. Square Plinth. On Glass by Sight. Follow directions for cube, Lesson 6.

Lesson 9. Box based on square prism or plinth. Place as in L. 6. If possible do all needed studying through Glass first, then draw on paper. No tracing. Finish in soft, gray lines.

Lesson 10. Small Child's Rubber.

Place at back of desk and trace with "Cross" crayon. Erase tracing and turn rubber in opposite direction. Study through Glass. Feel way around with lead pencil on Glass. Sketch by sight with "Cross" crayon on the Glass while Glass has cover behind it and is flat on desk. Test by looking through. Note errors and lay Glass down and correct.

Lesson 11. Exchange Rubbers. Draw on Paper.

Study through Glass and sketch on paper with lead pencil. While sketching, hold Glass in position for study so that sketching and studying may be carried on together. Place thin knitting needle on Glass horizontally and vertically to cover important points and note where needle cuts the contour. Feel way around on Glass with lead pencil to get the directions. Compare outlines of rubber with edges of frame. Measure height and width on the Glass. Finish with a little shading.

Lesson 12. Any interesting object. On Paper.

Proceed as in last lesson.

Lesson 13. Etc., etc. Other interesting subjects including groups may be tried if desired as explained in Grade VIII.

USE OF SPIRIT-LEVEL.

223. Although pupils may not be able to draw from difficult models that are far from the Glass, it is possible to begin to study models not on their own desks so that in Grade VIII more difficult models may be studied at a distance.

When studying from models and testing appearances, the Glass must always be held at right angles to a line from the eye to the model. When an object is below eye, the Glass will incline backward as in Fig. 8. When object is above eye, the Glass will incline forward. When object is on level of eye, Glass will be held vertical.

When using the level the Glass should be held with the level in the top side of the frame. Hold it in both hands and slowly move one hand up or down, as may be needed, to make the bubble stay in the center of opening.

Pupil can study a distant edge by placing pencil on Glass to appear to cover it or by tracing on Glass with "Cross" crayon.

Have pupils use spirit-level to prove the following principles:—

Horizontal retreating lines below eye appear to incline upward. Horizontal retreating lines above eye appear to incline downward. Horizontal retreating lines on the eye level appear horizontal.

Pupils can do this work without interfering with one another if they do not all try to study the same lines at the same time, or if this is desired, when one pupil remains seated and the next studies while standing, and so on to the end of the row.

Lesson 14. Testing angles of lines above eye.

Testing angles of lines below eye.

Testing angles of lines at eye level.

Study directions of edges with reference to edges of frame by placing pencils on Glass to cover edges and by tracing with "Cross" crayon lines on Glass to cover edges.

Lesson 15. Similar problems to those in the last lesson.

Lesson 16. Draw by Sight on Glass long, distant lines of room. Test by looking through Glass. Note mistakes, lay Glass down and correct. Test again and draw again, etc.

Lesson 17. Same as 16.

GRADE VIII.

Lesson 1. Cylinder and Cube grouped.

Place at back of desk so that two faces only of cube are seen.

Study through Glass as already described. Cover edges with pencils. Hold up plumb-line to locate points with reference to opposite outline. Place knitting needle horizontal on Glass to see what points, if any, are on the same level, and to determine levels with reference to each other and to the opposite outline.

Study carefully through Glass for at least ten minutes. Then place Glass flat on desk with cover behind it, and draw by sight on Glass with "Cross" crayon. Do not look through Glass until all outlines are complete. Then lay crayon on desk and test result.

Be sure not to make a single correction on Glass by tracing while it is in position for the test. If all lines do not cover edges of models, note these mistakes, lay Glass down and correct. Test again and so continue till result is correct.

Lesson 2. Same Models. Draw on Paper. Place cube on other side of cylinder.

Rest Glass on farther side of paper to hold it in place and hold Glass in position for looking through it to study the group. Use all tests explained in last lesson and sketch on paper with lead pencil.

Pupil can compare the direction of an edge behind the Glass with the frame. In the drawing, this edge must make an equal angle with the edge of paper. If parallel with edge of frame, it must be drawn parallel with corresponding edge of paper.

The measurement of the width may be taken by placing pencil horizontally upon Glass so that left end of pencil covers the extreme left point of group and covering the extreme right point of the group with the finger. In the same way, the height of the group may be set off on the pencil when it is placed on the Glass parallel with the left and right sides of the frame.

By comparing these measures with those of the drawing, mistakes will be readily corrected.

Pupils may also use lead pencil for making believe draw on the Glass. Thus the pupil "feels his way," as does the artist who draws "in the air." Do not distribute "Cross" crayons, so that there may be no copying of tracings. Pupils who trace and copy refuse to think and fail to progress.

Lesson 3. Draw by Sight on Glass.

Group of a square prism with two faces visible and a cube with three faces visible, the vertical faces seen equally. Place models ½″ apart, with one nearer than the other.

Study through Glass. Then place Glass flat on desk with cover behind it and draw with "Cross" crayon. Use all the tests explained in L. 1, and as many more as possible.

Lesson 4. The same as last lesson, only three sides of the square prism are to be shown and two sides of the cube.

Draw on paper as explained in L. 2.

Lesson 5. Three Models. On Glass.

Draw by sight with "Cross" crayon, the cube, cylinder, and square plinth. Pupils arrange their own groups and try to avoid unpleasant combinations.

Study, sketch, and correct as explained in L. 1.

Lesson 6. Three Models. On Paper.

Use cube, square prism, and square plinth.

Proceed as in L. 2.

Lesson 7. Three Models. On Paper.

Use square plinth, small flower pot, and a short cylinder or cube.

Proceed as in L. 2.

Lesson 8. Draw on Glass. Three Models.

Use square plinth, small glass jar, and square prism resting obliquely on desk and on square plinth. Draw on Glass by sight with "Cross" crayon as explained in L. 1.

Lesson 9. Three Models. On Paper.

Use a small box on which stands a cube with three faces visible, the two sides showing unequally. Place a square prism obliquely against box.

Follow directions in L. 2.

Lesson 10. Small Child's Shoe. On Paper.

Study through Glass. "Feel way around" on Glass with lead pencil and then sketch. Test by measuring the height and width on the Glass and by taking horizontal and vertical lines through important points, also by comparing outlines with edges of frame. Shade drawing if there is time.

Other more interesting objects such as open book, fruit and tumbler, vases, baskets, etc., may be studied if desired.

224. These lessons have been planned for pupils who have been trained, year by year, according to lessons for lower grades. Without this training, pupils can not do the work.

All beginners on the Glass, even those in Grade IX., must start with the simple lessons planned for the lowest grades. Advanced pupils may, however, take them more rapidly than lower grade pupils.

USE OF SPIRIT-LEVEL.

Lesson 11. Trace Right Farther Corner of Desk.

Pupil sit facing right corner of his own desk. Hold Glass with both hands at right angles to line from eye to corner of desk and without resting Glass on desk. Hold frame so that bubble remains in center of opening. Study edges of desk at corner, noting the angles which they make with the frame. Lay pencils on Glass to cover these edges, then trace them on the Glass with the "Cross" crayon.

Pupil sit higher or lower and notice that each change makes the angles different.

Lesson 12. Draw Left Farther Corner of Desk.

Pupil sit facing left farther corner of desk and draw by sight on Glass, with "Cross" crayon, the edges of the desk at corner. Hold Glass to test drawing by reference to the spirit-level. Then place Glass flat on desk and correct and repeat effort till lines will cover those of desk.

Then face corner of neighbor's desk and sketch by sight on the Glass.

Lesson 13. Strawberry Box on Paper.

Place at left corner of pupil's own desk. Study through Glass, then measure on Glass and apply tests previously explained. Indicate the lines of desk behind the box. Finish with shading if possible.

Lesson 14. Group on Paper.

Place boxes on corner of desk. Draw with lead pencil. Study first through Glass by placing pencils, measuring, etc.

Represent two edges of desk to show how models are placed on desk.

Lesson 15. Umbrella. Draw on Paper.

Hang six or eight umbrellas from top of blackboard. Study through Glass and refer to spirit-level. Shade if possible, with soft lead pencil.

Lesson 16. Groups of Japanese Lanterns.

Two or three lanterns in each group. Study through Glass, then sketch on paper and shade. Show background if it adds to the interest.

GRADE IX.

MODEL AND FURNITURE DRAWING.

Lesson 1. Three Type Forms on Paper.

Place objects on desk or on model rest not far away. Study through Glass, being careful to hold it at right angles to the line of vision and so that the bubble shows in the center of the spirit-level. Use all the tests explained in Grade VIII. Pupils will not "feel way around" or use any other test any longer than necessary, but will discard all tests as soon as they can see without them.

Lesson 2. Model of Chair. By Sight on Glass.

Make of stiff paper, as shown by Fig. 88, and fasten with paper clips. Place at back of pupil's own desk. Study through Glass but do not trace with "Cross" crayon. After careful study, draw by sight on Glass. When completed, test by looking through. Note errors and place Glass on desk and correct. No tracing of lines or points when testing.

A toy table, made of stiff paper (see Fig. 88), is a good model. Place it at back of pupil's own desk and draw by sight on Glass with "Cross" crayon.

Lesson 3. Larger Cardboard Chair.

Change the design and place on the corner of desk in front of

pupil. Do not distribute "Cross" crayons. Study model by holding Glass at arm's length with bubble in center of level. Place pencils on Glass to cover edges and note angles with frame. Locate points by plumb-lines, and by knitting needle, by measurements, etc. Sketch finally with lead pencil on paper. Test, correct, and shade if there is time.

Lesson 4. Cardboard Table. On Paper.

Change the design and increase size, and place model on corner of desk in opposite aisle. Use spirit-level whenever model is not in center of pupil's own desk.

Proceed as in last lesson and draw on paper and shade if possible.

Lesson 5. Chair by Sight on Glass and Paper.

A simple chair on platform or desk. Study carefully through Glass. Continual reference to level is necessary, for the Glass is moved unconsciously, and the frame is misleading as a finder if it is not held horizontal.

Sketch by sight, when the cover is behind the Glass. When complete, look through and test and correct, etc.

Draw the same chair in different position by sight on paper, without use of the "Cross" crayon. Study first through Glass, then sketch on paper with lead pencil of medium grade, then test and correct.

Draw the long lines of the room behind the chair and shade if there is time.

Lesson 6. Table at front of room.

Proceed as in last lesson, first drawing by sight on Glass, then after the position of the table has been slightly changed, making a drawing in pencil on paper. Shade if possible.

Lesson 7. Stuffed Birds and Animals.

A bird, about the size of a thrush, placed at back of pupil's own desk.

First, trace bird with "Cross" crayon. Then erase tracing and face bird the opposite way and study through Glass carefully.

Then trace on Glass a mark to show position of beak, and one to show tip of tail, and a third to show end of perch. Then lay Glass down and with the cardboard cover behind Glass sketch by sight on Glass with "Cross" crayon the bird and the pedestal, using the marked points to determine the size of the drawing. Test by looking through, then correct, etc.

Tracing of points for the size is not wise generally, but the bird is so different from the models studied, that these points may be traced in the first lesson only.

Lesson 8. Stuffed Bird. Draw on Glass.

Place at back of pupil's own desk, study through Glass. Then

place cover behind Glass and lay Glass on desk, and draw by sight on Glass with "Cross" crayon both bird and pedestal. No tracing of points to determine size. Test when completed.

Lessons 9 and 10. Bird. Draw on Paper.

Same bird as in last lesson. Study through Glass and "feel way around" on Glass. (See L. 6. Grade IV.) Then make shaded drawing on paper. Use very soft pencil for the darkest parts and one not quite so soft for the rest of the sketch.

USE OF SPIRIT-LEVEL.

Lessons 11 and 12. Larger Bird on Paper.

Place on corner of next pupil's desk. Study through the Glass. Shade if there is time.

Lessons 13 and 14. Stuffed Duck.

Place on desk in front and across the aisle. Study through Glass by use of spirit-level. Then make shaded drawing on paper.

Lessons 15 and 16. Stuffed Squirrel.

Place on desk in front of pupil. Study through Glass and make shaded sketch on paper.

The number of lessons required for these results can not be fixed, as much depends on the length of lesson and the preparation in other grades. A double period is almost necessary for satisfactory results.

Pupils in this grade can not do the same amount of work, for some need to be hurried, and others working at leisure can produce twice as many drawings as their neighbors.

If desired, the birds and animals may be studied before the furniture. In this case there should be more tracing and more drawing by sight on the Glass.

PAPER MODELS MADE BY PUPILS FOR USE WITH GLASS.

225.
1. Card $7\frac{3}{4}''$ square.
2. Circular card $5\frac{1}{2}''$ diameter.
3. Oblong card $5\frac{5}{8}''$ x $8''$.
4. Cylindrical model from oblong $5\frac{3}{4}''$ x $12''$ and two circular cards $3\frac{1}{2}''$ diameter.
5. Circular plinth from oblong $2''$ x $12''$ without circles.
6. Cube $2\frac{3}{4}''$.
7. Square prism $2\frac{1}{2}''$ x $2\frac{1}{2}''$ x $5''$.
8. Rectangular prism $1\frac{1}{2}''$ x $3\frac{1}{2}''$ x $6''$.
9. Square plinth $1\frac{3}{8}''$ x $4''$.

10. Table.
11. Arm Chair. } See Fig. 88.
12. Plant Stand.

The cube of $2\frac{3}{4}''$ is correct size for study of principles. For groups a $2\frac{1}{4}''$ cube is needed.

The square prism (No. 7) is correct size for study of principles. For groups a smaller one is necessary.

When not in use these models can be kept flat in an envelope between drawing papers, and the clips which are used to fasten models together should also be kept in the same envelope.

The models should be made of heavy construction paper, and before folding the lines should be creased by a pin.

Grade IX. From mounted specimen.

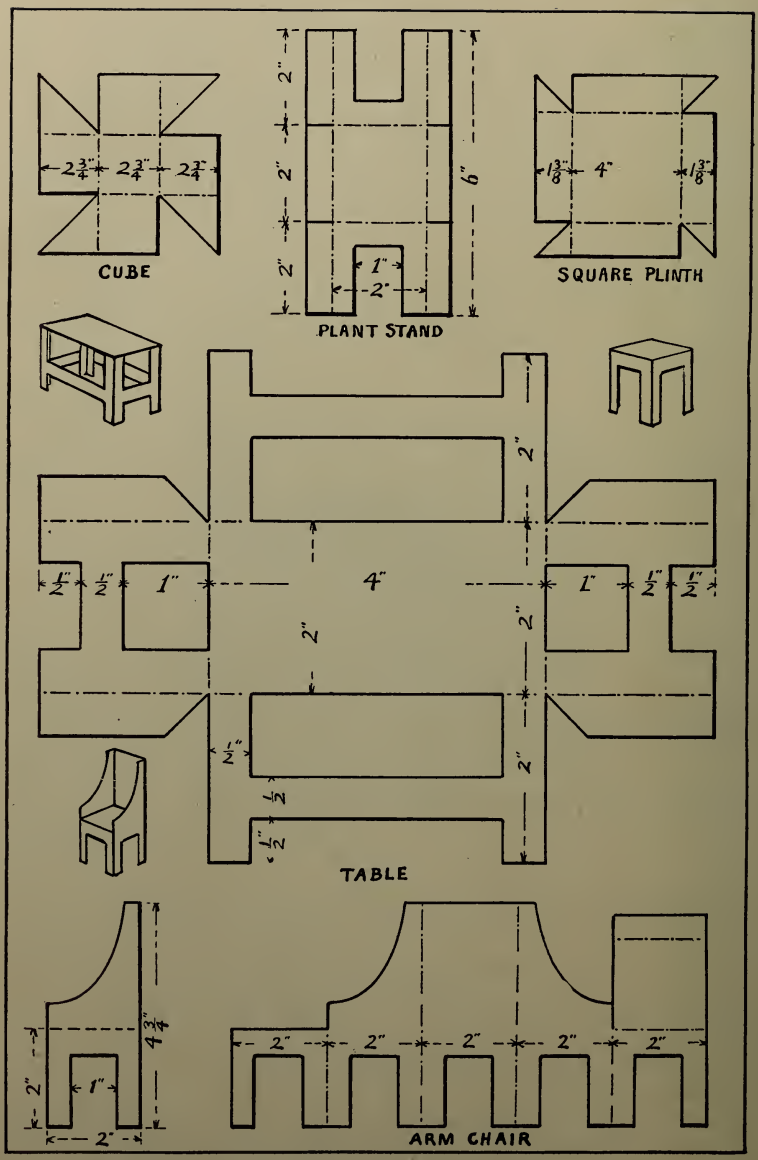


FIG. 88.—Developments of paper models for individual use.

Chapter X.

ADVICE TO THE ART STUDENT.

226. Art is More than Representation.—Art is superior to the facts of appearance. If this were not so the camera and the scientist would produce the best art. Art is a personal expression not so much of the material and visual facts as of the spiritual. Art reflects the emotions and inspiration of the artist even more than it does the optical image. Therefore there can be no formulas, recipes, or short cuts, and you waste time and money and your chance of real success as long as you try to find or evolve such.

227. Advertisements Deceptive.—If you can be satisfied to do commercial work that gives no reputation and slight returns, answer one of the many advertisements that seem to insure a short cut to fame and wealth; but try at least to realize that these promises are every bit as absurd as they would be considered if they related to success as a pianist with no need for long practice or finger exercises.

When education in art is as well understood as is education in music it will not pay to advertise the impossible feat of success in art without the years of hard work that the most talented require under the best instruction. Sir Joshua Reynolds stated the facts as follows:

"Excellence is never granted to man but as the result of labour. . . . A facility of drawing like that of playing upon a musical instrument cannot be acquired but by an infinite number of acts. . . . You must have no dependence on your own genius. If you have great talents, industry will improve them; if you have but moderate abilities, industry will supply their deficiency. Nothing is denied to well directed labour, nothing is to be obtained without it. . . . I will venture to assert, that assiduity unabated by difficulty, and a disposition eagerly directed to the object of its pursuit will produce effects similar to those which some call the result of natural powers."

228. Art Instruction Fails.—Art instruction is too generally directed to technique and finish or fads rather than to true vision. This crippling mistake is responsible for the general failure of art study whether in elementary or advanced schools, for the technique of any medium is difficult in proportion to the inability

to see truly. True vision will always find a way to expression, and therefore you must not believe that you should study water-colors, or oils, or pastels, or any other medium as if you were

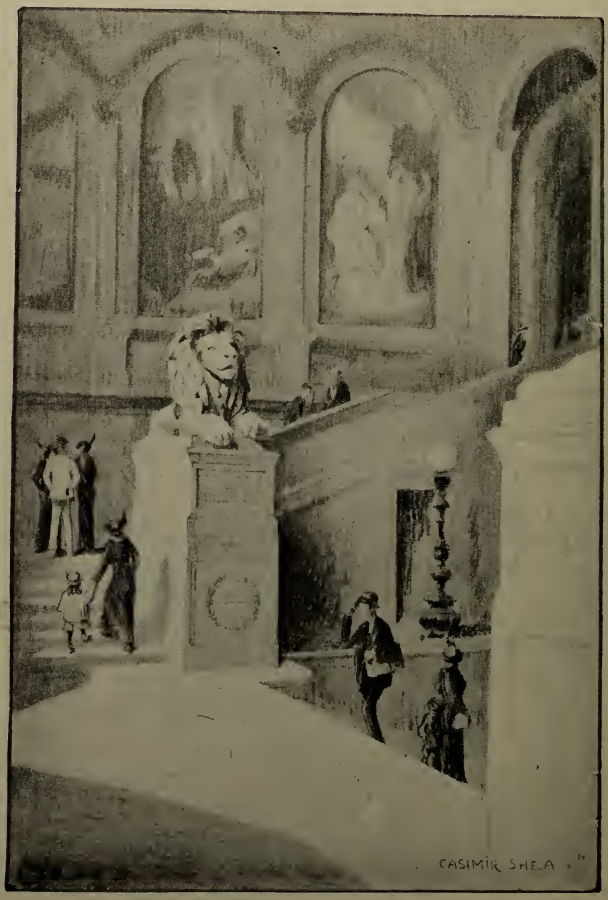


Fig. 89.—Public Library, by first-year student.

studying different subjects. Until your eyes are true you should have but one problem, that of perfecting your vision, and no technique should be permitted that takes your attention largely from the thought of truthful representation.

There are problems of technique that a teacher will aid in solving if you are not led to believe that there is only one right way. This idea is generally fatal to success, for the best way must be your own way, and you must find it, and change and develop it as your vision and your aims develop.

If you see your teacher or any artist painting, try to see others solve the same problem that you may realize how artists work in such different ways that even when their vision is equally true, their results may have slight resemblance even when done from the same subject.

Do not accept without question the opinions of any instructor or school, for specialists seldom have a broad education and often contradict each other. But when in any class or school you should do your best to follow the instruction given, and if you can not do this you should drop out.

Art schools taught by painters often neglect theory and science, while those taught by educators theorize at the expense of drawing and painting. Thus you will seldom gain in one school all that you need unless you obtain aid outside the school from books or correspondence courses.

229. The natural result of differences between teachers is a difference of opinion between artists, including those who teach and those who do not teach. On the one side are those who value the truthful vision the old masters had and who believe in trying to give students this vision even if it does take all the students' time for the six or eight years of art school study. On the other side are those artists who, realizing the failure of many good painters and draftsmen in the direction of design and composition, believe the student should be taught to express himself freely at the expense of all scientific and exact nature study. This effort to gain art, at the expense of all refinement of form and truth of appearance, has proceeded so far as to have nearly proven the absurdity of this attempt to obtain something in art for nothing in effort.

The methods of this book enable the average student to gain truthful vision in so short a time that there is no excuse for not studying memory drawing, design, and composition, and thus being able to do far better in that artistic free expression which is the master's pleasure, than is possible for those who have never had time to master the geometry of nature or the artist's perception of her appearances.

230. Anatomy Indispensable.—Anatomy is a difficult subject even for art school students who have lectures and casts and the life model to aid them, but you can master this subject if you are in earnest and will draw the bones and muscles and antique

figure upon the Glass as you studied the geometric subjects. It is wise, however, not to make a theoretical study of anatomy until you can draw the geometric forms easily and have also gained power to draw well from casts of the antique.

231. The Bones.—The skeleton is the basis of all outward forms, and so you should begin by drawing it in all possible positions. If you can not draw from a mounted skeleton which may be in some museum, art school, or doctor's office, you may be able to borrow parts of the skeleton, such as the skull and the arm and the leg, or you may be able to purchase casts or models of these, and the other principal bones. You should draw these on the Glass in all possible positions, and then you should draw them from memory until you can draw them in any position which they may be imagined to have. When able to give action and foreshortening on the Glass you should draw on paper and give the details.

A lay figure will greatly aid the student. These may be found of all sizes and prices up to life size, but an inexpensive small one will suggest the action and proportion and greatly aid in drawing the bones and muscles.

232. The Muscles.—After this practice buy anatomical plaster casts of the head, hand, and foot, showing the surface muscles, and draw these in all possible positions, first on the Glass and later on paper. As you draw the muscles you should study books on anatomy to learn the names of the bones and muscles, and the attachments and actions of the muscles. You should also try to find opportunity to study a cast of the entire figure that shows all the surface muscles.

233. The Antique.—Now buy casts of details of the figure including the head, hand, foot, the eye, ear, mouth, and nose, and draw these in many different positions on the Glass, and when you succeed on the Glass draw all these details on paper.

You should now be able to draw the skeleton and the surface muscles as they would appear within the casts of the antique to be found in art museums. If you can not visit museums for study, buy the largest cast of the entire figure that you can afford, and draw it on the Glass in all possible positions. Afterwards draw it on paper, representing the bones and muscles, and draw this figure often from memory.

234. Draw from Life.—Draw from life also in a sketch-book which you should always carry. Draw the seated people you may find in parks, and those walking, working, or playing, that you may see. Draw them from memory as well as from observation. In the gymnasium and at the beach and swimming pool you have a fine chance to study the figure in action and prove

the knowledge you have gained from the books and casts. If several students in the same town are studying drawing, they may form a sketch class and take turns in posing or in supplying a model. Where there is a will the way will be found even in this most difficult subject.

You need never lack a subject from which to study the figure if you have a couple of large mirrors at your disposal, for in one you can draw yourself as seen from in front, and by use of two you can draw yourself in many other positions.

235. Excellent practice may also be had by copying drawings and photographs of people and animals and of sculpture. These are fine subjects for memory drawings.

The above course of study will give you more power to draw the figure than you will gain in any course on anatomy that consists simply of the study of books and copying charts and blackboard drawings.

236. Perspective.—In Ruskin's day the laws of free-hand perspective had not been formulated, and the distortions of plane perspective prevented students from seeing truly. If you wish to be a painter or a sculptor you may not need more than the theory of free-hand perspective, but if you intend to be an illustrator, decorator, architect, or teacher you need the full science that determines the direction and length of every line by use of its vanishing and measuring points or by use of working drawings.

237. Still Life.—Whatever your ambition you should master still life in outline, values and color, for true vision comes faster from still life study than from any other subject, and you will save time in figure painting by the study of still life.

I have given no directions for the drawing and painting of the figure, because you will not need more assistance than that derived from your study of the subjects that I have explained.

The lenses will aid you as much in figure painting as in any other subject. This is proven by the requests that I have had from artists for large size lenses for use in their own figure painting.

238. Working Drawings.—Every High School graduate should be able to read and make working drawings, construct the figures of plane geometry, and define the lines, angles, plane figures, and solids of geometry. If without this knowledge, the student should gain at least as much as is given in Chapters I, II, III, IV, and XI and under Definitions of "Mechanical Drawing" by the author.

It is a mistake for art schools not to give this instruction, for whatever you are to do you should be able to make simple plans and elevations. A friend who is a portrait painter once said to

me that the year of study he gave to mechanical drawing was of more benefit to him than any other part of his art school course.

239. Art School Study.—When all possible power has been gained in a few years of home study the student is advised to attend some art school where he may draw, paint, and model the human figure, and work in the composition and sketch classes. As helpful as these classes is the association with the strong students of the advanced classes, and often the serious student will be able to enter advanced classes with very brief study in preparatory classes. Art schools may not be necessary for those of great genius, but they are advisable, and the student should make every effort to study in one for at least two or three years after he has done all he can at home. The student who finds this impossible may console himself by finding out how many artists have succeeded without the aid of art schools even when art study has been delayed to mature life.

240. General Education Necessary.—Some parents think that a child who has no special talent for other studies may succeed in an art school, and so many students waste time and money because they lack general education and sometimes the ability to acquire it.

The art student should have at least High School training, and College is preferable if drawing and painting can be studied throughout this course.

Special attention should be given to the History of Art, Architecture, Ornament and Costumes, for without this study the artist is confined to subjects before his eyes, and special illustrations at short notice are impossible. Edwin A. Abbey is said to have paid out for models and costumes more than he received for some of his works, and once he traveled from England to Spain to draw one subject from nature. He thus set an example which the student should study with profit, though in his later years Abbey might have improved his art if he had trained his memory to be less confined to the model.

241. Defer Technical Study.—Do not specialize for Design, Decoration, the Crafts, or any special trades until after you have had at least two or three years of drawing and painting in the best art school you can find or have gained the equivalent by the use of the Glass and lenses at home.

Industrial art is not possible without designers who are artists by birth and training, and you waste your time and chances if you begin in any technical school that does not make its first instruction include that of the school of fine art. When you can draw and paint and take rank as an artist it will be a simple thing for you to master the technique of any industry or art and succeed

far better than you could by making this your special effort from the start. The best paid designers are generally those who have had training as artists as well as designers.

The artist's problems are difficult, and so specialists have not insisted on a preparatory art school training; but now the methods of this book so shorten the time formerly required for true vision, that those who would succeed in industrial art must give time to the study of fine art.

242. Art Includes All Beauty.—Some of the finest art ever produced was made in the Orient hundreds of years ago. Machinery has made it as cheap to apply too much ornament as the proper quantity which the artist would have used. Thus the artisan and the machine have supplanted the artist.

Whistler's Judgment.—"If art be rare to-day it was seldom heretofore. It is false this teaching of decay. The master stands in no relation to the moment at which he occurs. . . . He is no more the product of civilization than is the scientific truth asserted dependent upon the wisdom of a period. The assertion itself requires the man to make it. The truth was from the beginning.

"So Art is limited to the infinite and beginning there can not progress. . . . Art cares not and hies her off to the East to find a favorite with whom she lingers caressing his blue porcelain indifferent to all save the virtue of his refinement.

"And again to the West that her next lover may bring together the gallery at Madrid and show to the world how the master towers above all; and in their intimacy they revel, he and she, in this knowledge; and he knows the happiness untasted by other mortal." (From "Ten O'Clock.")

243. Apply Art to Industry.—Though Whistler told the truth about the rarity of really great art you need not give up your study of art, or your intention of applying it to some vocation. Though you may not be one of the few great artists, you may still develop such refined perception for form and color that you may aid in directing public taste from the cheap and vulgar to the chaste and beautiful.

You may surely do this and enjoy your life and work if you are in earnest. But if reading this chapter and one of the same heading in "Light and Shade" can turn you from the study of art, then it is wise for you to find some other subject in which you can be more interested to really work hard. You can not succeed in any work unless you have faith in yourself and such love for the work that you refuse to accept failure as final, no matter how long success may be deferred.

When you have gained rank as an artist, if you are not able to

sell your pictures, you should apply your power to some commercial or industrial art, for it is wiser to gain a living in this way and be free to paint as you like for pleasure, than to feel obliged to paint as you do not wish to, in order to dispose of your work.

244. Refuse to Fail.—If tempted by discouragement read the lives of the noted artists and inventors and discover how often their success has come after years and even a lifetime of failure. Recently the papers told how Edison had failed hundreds of times before he solved a problem that seemed very simple. Sargent, who is now said by some to be the world's greatest painter, works more hours daily than the majority of students, and still scrapes his canvas clean many times before he gains a result that he is willing to keep.

You will therefore be wise to conclude that success is the result of refusing to accept failure as final; and of working patiently on each picture until you make it as perfect as you can see and feel.

Whether your final style will be due to direct solid brush work, or to indirect methods, you must have faith in yourself, for nothing is more fatal to health and success than fear. If you are unfortunate enough to believe in luck or fate, or inherited conditions, you should read the book "Success is for You" by Dorothy Quigley, and discover that education may increase brain power to such an extent that children so deficient mentally as to be entirely unable to attend public schools, may gain average mental power by study in a special school for such students.

245. Believe in Yourself.—Some students are fortunate in inherited ability that brings success at an early age, but many who think they are thus favored, and who trust to their genius more than to hard work, fail to maintain their fortunate start. Many others who have been failures in school secure permanent success through the gradual development of their power which comes from the capacity for taking infinite pains. Scientists now admit that undesirable inherited qualities may be overcome, and good qualities greatly increased. You should therefore have faith in your inherited abilities and greater faith in those latent powers that may be developed by patient hard work.

246. Believe in a Higher Power.—Your chances of success will also be increased if you can have a religious faith in a power greater than your own that inspires to the best, and aids all honest, unselfish effort. Belief in an omnipotent source that rules with love and justice, and rewards faith, prayer, and all right effort will enable you to overcome failures until they lead to final success.

Honest students of nature have in all ages gained very similar views of the Unity of God and man and the reality of a life after this, and if it is possible for you to declare confidently that it is "God who worketh in you and through you" your power will be increased equally with your joy in living.

Grade IX. From mounted specimen.

Chapter XI.

THE FAILURE OF EDUCATION.

247. Graft.—A significant incident came to my attention during the war. At a gathering of artists and teachers, the much discussed subject of war graft became the topic of conversation. One of those present remarked that graft was not confined to business and politics but is so potent in education that educators do not feel secure in their positions or free to teach as they wish.

A member of a School Board said that he had recently known of a teacher who paid a member of a School Board fifty dollars upon receiving an appointment as teacher.

An interested teacher described the effort of an agent for a book firm to obtain an order, and said that when the agent found he could not make a sale he said, "It may be worth while for you to know that Committees often act upon the suggestions of our firm as to the fitness or unfitness of a teacher." Shortly after this when this teacher was not re-elected and no reason was given for the discharge, the instructor remembered the agent's words and wondered if they were based upon a power able to influence the School Board.

248. Teachers Not Free.—An artist who taught part of the time then took the floor and related that she had been obliged to change her course in drawing by the report of a special committee of experts appointed by the School Board. She was positive that the members of this advisory committee were not influenced either directly or indirectly by selfish or financial interests, and yet their report forced her either to give up teaching or to substitute for her course one more in harmony with those of text-book publishers.

An instructor in one of the most noted schools in the country informed us that the report of a similar committee had caused free-hand drawing to be dropped from the course in spite of the objections of the Dean and his Faculty.

249. Teachers Not Respected.—Another teacher arose to say that teachers were resigning, not so much on account of the larger salaries in business, as to escape the influences that have changed ideals in the school-room and out, so that the teacher is less respected than formerly. She said that pupils are not taught obedience and respect in many homes, and that in some

FIG. 90.—Each student made many sketches outside the school. Unsatisfactory work was rejected until acceptable sketches could be made without assistance.

schools teachers are not permitted to enforce obedience or personally punish or discipline to secure order and the hard work that is needed for good lessons. Thus the teachers now have to

FIG. 91.—Faneuil Hall, by first-year student.

do much for the pupils that was not required formerly. In addition there are so many outside demands for posters, fairs, pageants, etc. that there is little time left for instruction.

250. Teachers Overworked.—A special instructor said that

another reason for the failure of the average student is the fact that teachers have so much to do as clerks that they do not have time or strength for teaching. She read the following from "Common Ground" (July, 1921):—

"Few indeed are the teachers who have not at some time or other pondered whether they were really teachers or clerks who did teaching between times. In other words there is need for relieving teachers of a greater part of the clerical work which is now assigned to them, so that they may be free to devote their time and strength to their proper work of teaching." The following was then read from the Journal of Education:—

"Teaching as it has been traditionalized in the last quarter of a century has been a strain on all class room teachers and the multitude of new requirements have been an overstrain."

251. Under the influences that have opposed drawing from nature in the Grammar School, there has been substituted much in the line of manual training. This work is interesting and valuable and makes an attractive exhibition, but often forces the Director who wishes to teach real drawing, to give up this effort and devote the time to some constructive work which has been seen and admired in the exhibit of a neighboring town. Thus it happens that High School graduates are seldom able to draw from objects, and often do not understand the simplest geometrical terms, for the study of geometrical and working drawings is as much neglected as that of object drawing. I would not omit the cutting and making of patterns and models. On the contrary, I would add to its importance by sometimes making the models from working drawings, but I do object to the entire neglect of object drawing and often equal neglect of working drawings.

252. Graduated Instead of Instructed.—Another teacher said that the conscientious instructor is often forced to give up either her position or the effort to maintain high standards of work by those above her who insist on diplomas for students who have failed in their studies. Others said that they had been forced to pass students who had not tried to study so often that they had found it impossible to maintain high standards in discipline or examinations. As a result, students graduate with the idea that success is possible without effort.

253. College Graduates Deficient.—Pres. K. C. M. Sills of Bowdoin College says in his report of 1921: "There are two weaknesses so glaring they call for extended comment. There is a very general complaint on the part not only of business men but also of men in professional life that the College graduate of today cannot write decent English."

"A second defect is found in the unwillingness of the College graduate of today to assume responsibility. He thinks it is his right that the College should give him an education, and that the responsibility is on the College and not on him."

254. This report says, "It is impossible to prove that graduates today are not as competent as in former days," therefore I wish to print in full the course required in different years in the Freshman Class in the Art school in which I have taught continuously from September, 1883, to January, 1921. The students were High School graduates who came from the entire state.

FRESHMAN WORK IN 1883–84.

INSTRUMENTAL DRAWINGS.

1. Geometrical problems. 2. Perspective. 3. Orthographic Projection. 4. Machine Drawing. 5. Building Construction. 6. Isometric Projection. 7. Projection of Shadows.

The above were finished in red and black ink lines and often upon washes of color, and there were numerous lecture sheets on each of the seven subjects.

FREE-HAND DRAWINGS.

8. Models in outline. 9. Models in chalk. 10. Models in water-color monochrome. 11. Models in charcoal. 12. Outline from cast of ornament. 13. Outline from foliage from nature. 14. Outline from cast of detail of human figure. 15. Outline from cast of animal. 16. Outline from furniture. 17. Charcoal or chalk point from cast of ornament. 18. Cast shaded with sepia or India ink. 19. Original Design from plant to fill geometric form. 20. Design for Encaustic Tile, Book Cover, Cotton Print, Oil Cloth, Wall Paper or Lace. 21. Specimen Drawing Exercises for public schools. 22. Painting in water-color of a flower from nature. 23. Analysis of styles of Historic Ornament. 24. Botanical Analysis of plant and four designs from it.

Examinations.

1. Plane Geometrical Drawing. 2. Orthographic Projection. 3. Perspective Practice. 4. Perspective Theory. 5. Model Drawing from solid. 6. Isometric Projection. 7. Projection of Shadows. 8. Machine Drawing. 9. Building Construction. 10. Historic Ornament. 11. Harmony of Color. 12. Drawing from Dictation. 13. Normal Instruction.—Examinations during the year and finals at the end were given in the above subjects.

FIG. 92.—From pencil drawing by Anna M. Hathaway.

FRESHMAN WORK IN 1907–08.

CERTIFICATE DRAWINGS.

1. Problems in Plane Geometry (Instrumental). 2. Model drawing in outline. 3. Group of common objects in outline. 4. Light and shade from colored objects. 5. Light and shade from draperies. 6. Light and shade from cast of historic ornament. 7. Details of human figure from cast. 8. Details of animal form from cast. 9. Details from historic schools of ornament. 10. Pencil, pen and ink and brush rendering from approved examples. 11. Water-color studies from still life and flowers. 12. Applied design.

Examinations.

1. Plane geometric problems (Instrumental). 2. Theory of Model Drawing. 3. Drawing from details of the antique. 4. Drawing from objects. 5. Historic Ornament and design.

255. Lowered Standards.—The required work in 1908 equals 46% of that required in 1884. Most of the students prior to 1900 were able to complete the class in one year. After 1900 the majority required two years to do this work, and so the six difficult scientific subjects which occasioned most of the failures were dropped, and less was required in the free-hand subjects.

In still more recent years the requirements were further reduced, with the result that the graduates have not been as successful as those of the years in which Walter Smith's courses were in effect. This was recognized, and some of the scientific subjects were put back within a few years. The students find these subjects difficult because of lack of preparation in the High School, but the serious ones are able to master them and do good work. In free-hand drawing the students of recent years have done better work than has ever been produced in the school; thus proving there is no lack of brain power, but of the sound and broad preparatory training which made the students in the early years of the school better able to do independent hard work and understand scientific subjects.*

256. Ethical Training Needed.—The failure in education arises from the failure of the home and the church to maintain

*Since these pages were written many changes have been made in the school. The requirements for admission and for graduation and the hours of study have been increased. Specializing in the lower classes has been stopped and more earnest effort demanded in all the classes.

It will take many years to fully overcome unsatisfactory conditions in education, for the causes are not local, and no individual can quickly influence the thought of a State or a Nation. But if the State will support this new effort to get back to the sane ideals of earlier days, it may in time prove that success in art and in industry equally demand the old-fashioned training in both Science and Art that Walter Smith fought for at the expense of fortune and life.

the high ideals of those who founded this nation. The desire for wealth has led to graft and corruption that are felt in every direction, so that we are compared with Rome before its fall and told that its fate will become ours if we do not quickly find a way to end graft by taking our offices out of political control and doing away with the injustice that threatens us now.

It is often claimed by those whose opinions are worthy of serious consideration that religion is the most important factor in the life of a nation. If this is true, it is important to find some way to give to all children simple ethical training in the truths that all religions accept, which must be believed and practiced by the individual or nation that is to live and prosper. Such essentials can be taught without coming under the head of religious teaching. In fact, I believe this instruction is now demanded by the law of 1860 which specifies that "good behaviour" shall be one of the required subjects.

257. Artists on School Boards.—The remedy for every evil is knowledge, and those affecting art education today will be overcome when the best artists and designers of the nation are able to act as members of School Boards and State Boards of Education.

As far as possible every such Board should have among its members the best painter and the best sculptor together with the best architect. It may not be possible to find enough men of these professions to serve in smaller cities and towns, but they can be found for State Boards and State Schools and the larger cities. Their influence in these places will in time be felt in all others, and cause drawing to be more practical and helpful, and to mean the elements of real drawing instead of the superficial showy work that now so often causes neglect of the elements.

258. National Control.—National control is advocated as the remedy, but when we investigate its results abroad, we question whether it will be a benefit before selfish motives can be supplanted by the desire for public good.

State and National control should mean that the best methods are explained and aid given to overcome local difficulties. Such control should suggest results desired and ways to attain them, but it should not enforce detailed steps, methods, exercises, and technique, or forbid original experiments. It should commend good results that prove power to see truly and work independently, regardless of the technique and methods.

Supervision that rigidly fixes details of subject, medium, and technique will do more harm than good, for even if the Director were a second Michael Angelo, he would fail, if he attempted to destroy the individuality and freedom of his assistants. Rigid rules for technique and methods emanate from amateurs and

publishers. Even if a strong artist should attempt to formulate them for general use he would fail to benefit the teachers he was trying to aid, for they would not understand or apply them correctly.

Art requires freedom and spontaneous expression, without much thought of technique. The educator who insists on thought about subject, technique, and pedagogical steps thus renders art impossible.

There is no question about the good that could be done by a National Art Director if one could be found as competent and courageous as Prof. Walter Smith; provided he could be upheld in his judgment, which would of course be as unsatisfactory to the publishers as was that of Professor Smith. Those who know the influences that are exerted upon officials will hesitate to further increase government control of art education until such control can be freed from the influences of big business.

259. Drawing Courses Controlled.—From Walter Smith's time to the present the adoption and use of books and materials have often been secured by means and methods little suspected by the general public. Those who are informed say that the field of education has proven as profitable and as susceptible to trust methods as other lines of public necessities.

When drawing books were generally used by all the pupils in all the grades, the yearly sales were very large and the profits so great that every effort was made to secure adoptions. In recent years books for pupils have been less used, and today the drawing teacher has no conception of the conditions that ruled a few years ago when positions were so largely controlled by the firms whose books were most widely used. Today publishers' influences relating to drawing instruction are felt most in the selection of teachers whose recommendations for positions may be withdrawn if the teacher asserts that he will be independent and absolutely free to use whatever books or methods seem best to him.

The most pernicious influence in elementary schools arises from the power of the text-book firms to plan the instruction that shall be given in these schools and almost force its adoption by indirect means that are never even suspected. How complete this control is will be discovered if, perchance, the strongest painter in the country should be appointed to any School Board with the idea of making drawing in the public schools more practical. The chances are that after a few years of futile effort this artist would resign in despair of ever changing the fashions that seem to regulate what shall be taught in the drawing course as rigidly as the fashions in dress fix the cut and length of sleeves and skirts.

The applicant for a position to teach drawing in the public and elementary schools is asked first for the diploma or degree of some School. Without this diploma professional power to draw and paint and even success as a teacher count for but little, and the independent teacher of ability has little chance to keep a position except by following the latest fashions, no matter how absurd they may be.

260. Kansas State Law.—Frequent complaints are heard from teachers that they are forced to change books and methods so often that the pupils barely begin to succeed with a method before they are forced to change to another. Teachers can not publish facts that reflect on the influences back of changes in text-books, therefore little becomes public; but it is a fact that the State of Kansas has passed a law which does away with text-book influences upon local School Boards.

"This law provides that a commission selected for that purpose, after a thorough examination of all the samples submitted, shall designate the books best suited to the schools of our state, and that then these shall be the basal texts used throughout the state, supplemented only by other books likewise chosen by this commission.

"Some of these texts, in fact all texts used in the elementary schools are now printed at our own State Printing Plant, the original manuscripts having been purchased by the State, or a royalty being paid on the plates.

"This action was taken for several reasons, — lower cost, greater convenience to pupils and patrons, and the many advantages of uniformity being the chief ones."

Other advantages than those named result from this plan, and it seems that Kansas has shown the way to great improvement in our education.

Chapter XII.

STATE LAWS ON DRAWING.

261. Drawing a Required Subject.—Recently a School Board made drawing an optional study in Grammar Schools, thus destroying its value. This action was taken in ignorance of the following laws:—

Gen. Laws, Ch. 71, S. 1, as amended. "Every town shall maintain . . . a sufficient number of schools . . . and shall give instruction in orthography, reading, writing, the English language and grammar, geography, arithmetic, drawing, the history of the United States, the duties of citizenship, physiology and hygiene, good behaviour, in-door and out-door games and athletic exercise. . . ."

Gen. Laws, Ch. 71, S. 18. "Evening Schools." "Any town may, and every town in which there are issued certificates authorizing the employment of twenty or more persons who do not possess the educational qualifications enumerated in Sect. 1 of Chap. 76, shall, maintain for not less than forty evenings during the following year an evening school or schools for the instruction of persons over fourteen years of age, in orthography, reading, writing, the English language and grammar, geography, arithmetic, industrial drawing both free-hand and mechanical, the history of the United States, physiology and hygiene and good behaviour. . . ."

262. The amendment which made drawing a required subject was passed May 16, 1870, and the wisdom of this act has not been questioned until the present time. One of the most noted educators in the country recently wrote as follows: "I doubt if the School Committee that will make drawing an optional study can properly be called educators."

263. Publishers' Responsibility.—The condition of drawing today is the logical result of the effort to make drawing interesting by substituting for the hard work of truthful study from nature, the easier problem of copying to produce results more attractive to the untrained eye.

The first retrograde step was taken when the publishers printed dots in spaces formerly blank, that copies might be produced more quickly and more books sold in a year.

The next step was to take out the difficult problems in in-

strumental drawing. After this, drawing from objects and nature was supplanted by picture study and illustrative work made without visual training in perspective. The last step was taken when text-books for pupils were published with the statement that the power to draw from objects is of such slight value, that the study of design and art should take its place in the Grammar Grades.

School graduates never had so little power in drawing from objects as they manifest today, and it is not strange that an effort should be made to make drawing an optional study by those not well informed on this subject.

But this failure in free-hand drawing is not the failure of a true drawing course, but of a narrow and weak substitute forced upon this age through the control of education by financial interests.

264. Teachers' Responsibility.—Teachers are in part responsible for this condition, since the publishers have sought to produce books that would sell to the largest number, by consulting teachers everywhere and trying to combine their differing opinions so as to please all. Too many cooks spoil the broth, and in this instance have not only made drawing of little value in the schools, but have brought about decreased sales of books for pupils' use that seems just retribution.

265. Publishers can not shift all responsibility to the teachers, for they exerted their authority against the sane education planned by Walter Smith and forced him to relinquish his rights and supervision entirely. If they had wisely exerted their power in favor of a sound education instead of popular and, for the moment, salable fads they might have retained a profitable business and increased the value of drawing in the schools.

If half the effort and money expended in the past forty years in chasing fads and unrelated ideals of the rainbow nature had been spent under the continued direction of Walter Smith, this nation would today be the best informed on fine and industrial art lines of any nation on earth.

266. Report of College Examiners.—To show that I have not over-stated the evil results of text-book control and the changes that are needed if this nation is to maintain itself as a manufacturing nation, I will quote from a letter published by the Board of College Entrance Examiners of New York on March 30, 1918:—

"In the opinion of the committee of examiners in Freehand Drawing, the quality of the work in the examinations in this subject has, in spite of the new set of requirements adopted in 1912, shown so little improvement, that it seems best to this

committee again to call the attention of teachers to these new requirements, a copy of which is appended, and to state briefly something of what it understands to have been the general aims of the committee which drew them up.

"In the opinion of the present committee of examiners, the general purpose of the new requirements was to encourage systematic training in drawing as a means of description of form, as a valuable mode of expression in itself, useful in connection with almost every occupation and profession, and also as an invaluable aid in the development of the power of observation. At the same time the committee of revision wished to discourage as far as possible the superficial attempts at 'artistic' production which have unfortunately been common in preparatory school work. It felt that a clear distinction ought to be made between design in the terms of drawing or painting on a flat surface, and the description of the aspect of objects by means of drawing. The latter is a useful means of expression like a language; and in the teaching of drawing from this point of view, *accuracy of observation and of description should be recognized as of primary importance.* The principles of design, on the other hand, can be taught much better in connection with abstract drawing and painting in lines and flat tones in which representation is either suppressed entirely or subordinated to the aim of orderly arrangement. The attempt to combine the two points of view in the production of works that shall look "artistic" has, under present conditions of preparatory school teaching, usually led to results which have been unsatisfactory both from the standpoint of design and from that of representation of form, and has, by its superficial pretence, actually tended to degrade the taste and to blunt, rather than to sharpen, the observation of the pupils.

"In the opinion of the committee of examiners, school courses should be so arranged that courses in design come in the lower grades, for children can be taught the fundamental principles of order at a very early age, and they take readily to practice in design as well as to representation in the abstract mode of line and flat tone. On the other hand, the accurate description of objects as existing in the round, involving an understanding of perspective projection, is usually too difficult for younger children, and this may very well be confined to the higher grades, perhaps to the high school. In this kind of drawing most valuable training in taste may at the same time be secured by the selection of objects to be drawn with regard to their quality from the point of view of design. There is no better way to stimulate one's sense of beauty than to make accurate studies of works of art or of fine natural form. Examples of the work of the greatest draughtsmen

of the world are now easily accessible in the form of photographs, and these ought to be constantly studied and some of them copied as standards of performance. For use of line, Egyptian wall-paintings, Greek vase-paintings, Chinese, Japanese, and Persian paintings or drawings are especially to be recommended; for expression of form by means of shading, the figure drawing of the great masters of the Renaissance are especially instructive.

"To make the work of the higher grades more definite and systematic, the committee of revision thought that it was better to leave out the expression of color values; and particular attention is now called to the statement in the requirements, 'without attempt to represent color or color values', and to the customary phrase in the examination questions, 'without regard to color value'. By color value is of course meant the degree of lightness or darkness due to the actual color (the local tone) of the object, as opposed to the lightness or darkness due to the relative illumination of surface. On account of the greater complexity of value relations involved, as well as on account of the comparative ease with which a certain specious pictorial effect may be obtained, the attempt to express color values has, under preparatory school conditions, tended to induce inaccurate and slovenly work; but it ought to be possible, on the other hand, to give in these schools entirely adequate training in accurate description of the form of simple objects in light and shade—that is, drawing in which the attention is confined to the rendering of relative illumination of surface.

"The examiners do not wish to prescribe any particular technique of shading, but they do wish to make clear what kind of drawing is expected on the examination papers. They also wish to emphasize the fact that, with all consideration of color values omitted, the expression of form by a rendering of the relative degrees of illumination of the different planes of modelling may be perfectly achieved. The representation of the different degrees of shade may be abstract, in two or three tones, giving only the main distinctions of light and shade (objects seen in sunlight make especially good subjects for this kind of drawing on account of the clean-cut division between light and shade), or it may give complete modelling.

"Aside from the question of omission of color values, the drawings submitted by candidates in this subject have revealed most serious faults. They have indicated, first of all, a lack of proper training in the establishment of positions and measures in the laying out of the drawings; too little stress has been laid on the fundamental principles of perspective; and not enough attention has been given to training in the understanding of the structure of the objects drawn.

"DRAWING

"*One unit*

"The requirement in Drawing is based upon the statement of entrance requirements in this subject as contained in the catalogues of colleges and universities represented in the College Entrance Examination Board.

"The candidate's preparation in drawing should be directed toward training him in accurate observation and in definite and truthful representation of form, without attempt to represent color or color values.

"The candidate should be able to show correctly and with lines of good quality simple form in correct perspective in the size in which it is felt in the plane of the drawing, or larger or smaller. It is recommended that pupils should be taught to draw from the object itself rather than from the flat.

"Correctness of proportion and accuracy in the angles and curves and structural relations of the parts of every object drawn are of the highest importance.

"The elementary principles of perspective are to be thoroughly learned, and the candidate should be able to apply them in free-hand drawing from the object or from the imagination.

"No definite prescription as to method of teaching is made. The examination will test the preparation of the candidate in the following points:

"1. Ability to sketch from the object with reasonable correctness as to proportion, structure, and form. It is recommended that the subjects drawn include simple geometrical objects and simple natural objects such as living plant forms.

"2. Ability to sketch free-hand from dictation with reasonable accuracy any simple geometrical figure or combination of figures.

"3. Ability to represent accurately in perspective a simple geometrical solid of which projection drawings are given, and ability to make consistent projection drawings of a simple geometrical solid of which a perspective representation is given.

"4. Ability to answer questions in regard to the principles involved in making these drawings."

267. The above report is a hopeful promise for the future, for students who meet these requirements must have all the industrial and scientific training planned by Walter Smith and also the power to draw free-hand from objects.

The letter conforms to general belief in advising against object

drawing in the Grammar Schools and the representation of color values in light and shade study.

In view of the difficulty of doing such work honestly by present methods this advice seemed necessary, but if the authors of this letter could have seen the children pictured in Fig. 75 at work their opinion would have been different.

If they could have seen the production of the Frontispiece they would have realized that the Painting Glass makes it easier to represent all light and shade and color appearances than it is to work conventionally by any plan that divorces the representation from the true appearance.

Either the drawing lesson means that we are teaching pupils to see truly, or that we are teaching them not to see at all. Unfortunately this latter is the result of much instruction now given and, until the effort for conventional modes of expression ceases and it is realized that truth is easier and more interesting than conventions, little progress can be made.

268. Madame Cavé's Method.—The aversion toward object and industrial drawing is not a new thing, and neither is the method of this book entirely new, as will appear from the following, written by Eugene Delacroix, which appeared in the *Revue des Deux Mondes*, Sept. 15, 1850, as a review of Madame Cavé's book "Drawing Without a Master":

"This is the only method of drawing which really teaches anything. . . .

"Can we wonder at the general aversion toward the study of drawing? Madame Cavé, however, as she says in her preface, would have this study like reading and writing form one of the elements of education, by suppressing all false methods, and rendering instruction not only systematic but easy. . . .

"But how shall we learn to draw? . . . Where shall time be found for the long apprenticeship in which the great masters spent their lives, and that in the absence of all methods? For there really is none in the study of drawing. . . . The best master can do no more than place a model before his pupil, telling him to copy it as well as he can.

"A knowledge of nature resulting from long experience gives to the finished painter a certain skill in the process . . . ; but instinct still remains to him a surer guide than reason. This is why the great masters never stopped to give precepts upon the art they practised so well. . . .

"Madame Cavé's sole aim is to cultivate the eye correctly. Thanks to her method, which is simplicity itself, proportion, contour, and grace will come of themselves and appear on the paper or the canvas. By means of a tracing made upon trans-

parent gauze from the object to be represented, her pupil cannot help acquiring a knowledge of foreshortening, that stumbling-block in all kinds of drawing. She accustoms the mind to all the absurdities and impossibilities it presents. By requiring the repetition from memory of the outline she gradually familiarizes the beginner with difficulties; this calls in science to the aid of growing experience, and at the same time opens to the pupil the career of composition, which would be forever closed without the assistance of drawing from memory. . . ."

269. Madame Cavé had no crayon that would draw on clear glass, so she used thin cloth stretched upon a sliding frame that was held upon an easel. The device was so large and expensive that only one could be provided for a class, but the results were so remarkable that the Minister of the Interior requested the Inspector General of Fine Arts to report upon the method. The following is taken from this report signed in 1851 by Felix Coitereau:

270. French Government Report.—"Tracing a drawing or some object in nature seen through a thin gauze; reproducing the traced image by eye alone and ascertaining by means of the tracing if the reproduction is exact—this is the starting point of this method. . . .

"This first exercise is followed by drawing from memory; the pupil is required to reproduce without the aid of the model (or the tracing) the drawing which she has previously made and traced. . . . I have established the following results:

"1. A remarkable correctness in the ensemble and contour of a figure or any other subject.

"2. A reproduction from memory scarcely distinguishable from the original drawing.

"3. Acquaintance with the masters.

"4. Finally, the idea of perspective; that is, that without having learned any of the rules of the science, pupils execute correctly the greatest difficulties in the art of perspective foreshortening.

"Thus by exercising the memory of children, giving accuracy of vision and firmness of hand at the age when their organs, still tender, are docile, Madame Cavé renders them better qualified for the industrial professions, makes them skillful instruments in all the trades which pertain to art.

"With the old methods one could not learn to draw before the age of twelve . . . because the judgment is not developed. With the ingenious teaching of Madame Cavé the child of eight years learns almost unconsciously to observe and compare, to form his own judgment and at the same time to acquire that

skill which is indispensable in every species of manual labor. Here, then, we have genuine improvement in the education of the children. . . ."

271. This opinion should refute the arguments of those who claim that drawing will benefit only the few who follow art as a profession, but I also wish to quote a few sentences from the sermon, "Blessed be Drudgery" by Rev. William C. Gannett, since of all studies drawing is the one which best develops the qualities named by Mr. Gannett as essential for success:

272. Blessed be Drudgery.—"Our prime elements are due to our drudgery,—I mean that literally, the fundamentals, that underlie all fineness and without which no other culture worth the winning is even possible. These, for instance,—and what names are more familiar?—power of attention, power of industry, promptitude in beginning work, method and accuracy and despatch in doing work; perseverance, courage before difficulties, cheer under straining burdens, self-control and self-denial and temperance. These are the prime qualities; these the fundamentals.

"Again, then, I say, let us sing a hallelujah and make a fresh beatitude to Drudgery: *Blessed be Drudgery!* it is the one thing that we cannot spare.

"This is a hard gospel, is it not? But now there is a pleasanter word to briefly say. To lay the firm foundations in ourselves, or even to win success in life, we must be drudges,—that I take for granted now. But we can be artists, also, in our daily task. And at that word things brighten.

"'Artists,' I say, not artisans. The difference? This: the artist is he who strives to perfect his work,—the artisan strives to get through it. The artist would fain finish, too; but with him it is to 'finish the work God has given me to do!' It is not how great the thing we do, but how well we do it, that puts us in the noble brotherhood of artists.

"A third time and heartily I say it,—'Blessed be Drudgery!' For thrice it blesses us; it gives us the fundamental qualities of manhood and womanhood; it gives us success in the thing we have to do; and it makes us, if we choose, artists,—artists within, whatever our outward work may be. Blessed be Drudgery,—the secret of all Culture."

EDUCATION FOR THE TALENTED.

273. Talented Unable to Study.—I was appointed to the Faculty of the Normal Art School in 1882 at the age of twenty. Since then I have met thousands of students and have often

found that those who continue art school study lack the interest and ability of many who are financially unable to enter an art school. Therefore I wish to propose a simple way to aid talented students to develop power by home study.

Figs. 93 and 94 reproduce home work by two High School boys who used the Drawing Glass in connection with the University Extension Course in Free-hand Drawing. At the time these drawings were made this course was restricted to five criticisms, but as these could extend over a full year great gain was possible. This is seen on comparing the faulty armchair in Fig. 93 with the well-drawn and difficult street scene. The boy who made these drawings was unable to continue art study beyond the five lessons given by the State. The boy whose work is shown by Fig. 94 took up newspaper illustrating and finally saved enough to attend an art school.

274. The Talented should be Aided to Study.—The drawings made by these boys while in High School are much better than average art school results, and students of such ability who can not afford to enter art schools should be aided to do all they can at home, and then they should be assisted to study in some good art school.

By home study of this book and a criticism once in two or three months of the results produced by the aid of the Drawing and Painting Glass such students could learn to draw and paint at home better than many art school students do after several years of study. (See the Frontispiece.)

Students of ability thus taught would so raise the standards in art schools that the weak and frivolous students would drop out of their own volition, or be dropped because there would be room for only the serious students. Thus standards would be raised in art schools and in professional life.

In France the talented student is assisted, and he must be in America if we are to lead in industry or the arts. This can be done by any art school that will apply the methods of this book to aid home students to overcome the crudities of untrained vision.

275. Home Study Class of the School of the Museum of Fine Arts, Boston.—Since object drawing has not been taught in the public schools, students have entered art schools entirely unprepared to do the truthful drawing formerly demanded. Many art schools have lowered their standards to retain their students, and therefore many students who desire to do the best are misdirected.

The School of the Museum of Fine Arts is an exception, for now as always it demands the exact drawing and truthful painting

FIG. 93.—Drawings from home study class made by a high school boy. The first was made before use of the Glass. The lower was sent for the fifth criticism after nine months' use of the Glass.

which have prepared so many of its graduates to take first rank. But in recent years the work in this school became more difficult for both instructors and students, and so when the Faculty found that the methods of this book were proving more successful for beginners the School at once adopted them for the still life and perspective classes.

A year's trial having proven that untrained beginners may make rapid progress in both drawing and painting, the School established a Home Study Class, and the Circular for 1922 states that "pupils who have done successfully a year's work in this class before entering the school may expect to be advanced more rapidly and thus shorten their school course."

Art schools that believe in the old masters' methods, and try to secure truthful drawing and painting, must be interested in the method that caused the above statement to be made, for it holds out the hope that in spite of bad elementary instruction the art school student may now gain true vision so quickly as to have time for memory drawing, composition, and other essential problems that are crowded out when drawing must be studied by the old methods.

276. Art School Home Study Classes.—Any art school may improve the standards of its classes by forming a Home Study Class, and advising students to learn to draw and paint still life by closely following the methods of this book for a year or more of home study before entering the school.

The University Extension Course of Massachusetts now offers criticisms in outline drawing only, based on the use of the Drawing Glass. This barely starts the average student, but the State can do no more, and art school study assisted by the State will not be possible for many years, if ever.

Such a course in outline is, however, not enough to interest most students with artistic power, for it demands too much practice from uninteresting subjects before the students can realize the need for it or the value of it. A few talented students may persevere and accomplish results such as those of Figs. 93 and 94, but many students of ability will fail to continue unless the Painting Glass is provided, and the study of drawing and painting carried on together.

This method supplants theories and conventional correspondence instruction with independent and exact observation and self-discovery of mistakes, and will permit thousands in remote places to gain skill of eye and hand that otherwise would be unable to profit by good instruction.

The serious student will find the Glass so helpful that there may not be need for more than three or four criticisms the first

FIG. 94.—Drawings from home study class made by a high school boy seventeen years old. These drawings were sent for the fifth criticism after a year's use of the Glass.

year. Thus self-taught progress will be rapid and inexpensive, and even if paintings were sent for criticism monthly, the expense would be but a small part of that required for many correspondence courses whose value may be indicated by the minus sign.

Those who do not understand this method may oppose it, but the artists and art schools that teach honestly must realize that it will do more to aid art and the artist than any other influence.

When all public school graduates are able, as they should be, to draw and paint simple subjects with the artist's vision for truth, the public will judge art on its merit and be eager to recognize and support the few artists with real genius who will then follow art as a creative profession rather than as merely a descriptive or a representative trade.

277. Prizes for Home Study.—Instruction can be given in such a Home Study Class for a small part of the fee demanded by many schools that promise much and do little except provide copies, theories, and technical training that are worthless to those who can not draw by sight from nature.

When it is known that the best art school instruction is provided for such home students, and that the self-criticism gained from use of the Glass is better for the beginner than personal criticism from any artist, there should result a profit that will in time establish a fund to aid talented and needy students to attend the school.

Wherever the value of such a Home Study Class is proven, it is believed that gifts and bequests may be provided to enable all needy students who have shown their exceptional ability to attend the art school.

The prizes established to aid the most talented and best-prepared students to study in the art school classes after all possible home progress has been made should not be enough for full support, and should be given as a loan to be repaid with small interest when the student is able.

This idea offers more for the money required than any other, and should appeal to those who wish to benefit the race by an education that can be dispensed without danger of injuring those who profit by it. If the sacrifices and privations borne by art students in order to continue study could be known there would be an instant response to this appeal which would enable the talented to gain the training they can not secure now.

REFERENCE BOOKS.

Before studying these books the following paragraph from "Lectures and Lessons in Art" by F. W. Moody should be considered:

"If you wish to succeed as an artist, waste no time in theories . . . study not the words of critics but the works of the old masters —these alone will enable you to form a sound, broad and liberal judgment. There is good in all styles; use principles for your own guidance, not to condemn others. Talk little, do much, and you will acquire by work and observation a taste and power which will enable you to form a style of your own, free from an exaggerated regard for material on one hand, or from a reckless bravura of execution on the other. Always mistrust those who prove any particular art is wrong; and when an artist has a theory, you may be pretty sure it is only a cloak for his own deficiencies. Artists are particularly ingenious in this sort of self-deception; but nothing is a greater impediment in the race for true excellence than this. Leave them to their own ideas and beat them."

The above advice was intended for artists, and those who wish to draw and paint well should follow it until their eyes are true for nature's effects.

When study of this book and use of the Glass have given you true eyes you should read and observe widely to realize that though the painters' efforts to-day to represent transient effects of light and color constitute the latest and most difficult feat of vision, it is by no means to be judged the height of art attainment. In fact, you may be a master in representing appearances and yet fail to be an artist.

For this reason I have included books with many and conflicting opinions on art. Study them as you study pictures in order to evolve your own theories and your own methods, and try to realize that the other fellow may be as honest and as successful in his ideals as you are even when his viewpoint and results are opposed to yours.

ART AND ARCHITECTURE.

A History of Art. Giulio Carotti. $5.00.
A History of Ornament. A. D. F. Hamlin. $5.00.
Apollo. A general history of the plastic arts. S. Reinach. $2.00.
Art for Art's Sake. John C. Van Dyke. $2.50.
Artist and Public. Kenyon Cox. $2.50.
Architecture for General Readers. H. H. Statham.

Art Education Scholastic and Industrial. Walter Smith.
A Short History of Art. Julia B. De Forest. $4.50.
Concerning Painting. Kenyon Cox. $2.50.
Considerations on Painting. John La Farge.
History of Art. Goodyear. $3.00.
Lectures and Lessons on Art. F. W. Moody.
Mural Painting in America. E. R. Blashfield.
Old Masters and New. Kenyon Cox. $3.00.
Outlines for the Study of Art. H. H. Powers. $3.00.
Photographs from Old Masters. (Reference only.) Braun.
Reproductions of Old Masters' Drawings, such as the Dutch Masters by H. Kleinman.
Royal Academy Lectures on Art. George Clausen.
Six Lectures on Painting. George Clausen. $2.50.
Ten O'Clock. J. M. Whistler.
The Appreciation of Architecture. Russell Sturgis.
The Architecture of Colonial America. Eberlein. $3.50.
The Classic Point of View. Kenyon Cox.
The Higher Life in Art. John La Farge.
The Fine Arts. Baldwin Brown.
The World's Painters. D. L. Hoyt. $2.00.
University Prints. Bureau of University Travel, Boston.

ANATOMY.

Anatomical Diagrams. James M. Dunlop. $2.50.
Art Anatomy. William Rimmer. $20.00.
Figure Drawing and Composition. R. G. Hatton. $5.00.
Human Anatomy for Art Students. Sir Alfred D. Fripp. $4.50.
The Human Figure. Vanderpoel. $2.75.
Tree Structure. Rex Vicat Cole. $4.50.

COLOR.

A Color Notation. Albert H. Munsell. $1.50.
Chemistry of Color. Church.
Color Study. Anson K. Cross. 90 cents.
Text-book of Color. Ogden N. Rood.

DESIGN AND COMPOSITION.

A Discussion of Composition. Van Pelt. $2.25.
A Manual of Decorative Composition. Henri Mayeux.
Nature the Raw Material of Ornament. L. F. Day. $3.00.
Ornament and its Application. L. F. Day.
Ornament the Finished Product of Nature. L. F. Day. $3.75.
Pattern Designing. L. F. Day. $3.00.
Pictorial Composition. H. R. Poore. $4.00.
Practical Hints on Composition in Painting. John Burnett.
The Principles of Design. E. A. Batchelder. $4.00.

DRAWING AND PAINTING.

Applied Drawing. Harold H. Brown. $1.50.
Brush and Pencil Notes in Landscape. Sir Alfred East, R.A. $3.75.
Drawing for Art Students and Illustrators. A. W. Seaby. $3.75.

Drawing from Memory and Mind Picturing. R. Catterson-Smith. $3.00.
Landscape Painting. Birge Harrison. $2.50.
Learning to Draw. Viollet-le-Duc.
Letters to a Painter. Ostwald (translated). $1.25.
Light and Shade. Anson K. Cross. $1.50.
Materials of the Painter's Craft. A. P. Laurie. $1.50.
On Drawing and Painting. Denman W. Ross. $3.50.
Painting and the Personal Equation. Charles H. Woodbury. $2.00.
Pen Drawing. Charles D. Maginnis. $1.50.
The Art of Landscape Painting in Oil Colors. Sir Alfred East. $4.50.
The Painters Palette. Denman W. Ross. $1.50.
The Practice and Science of Drawing. Harold Speed. $4.50.
The Practice of Oil Painting. Solomon V. Solomon, R.A. $4.50.
The Training of the Memory in Art. L. De Boisbaudran. $3.00.
Technique of Painting. Charles Moreau-Vauthier.
Tone Relations in Painting. Arthur Pope. $1.50.

PERSPECTIVE AND TECHNICAL.

Alphabets Old and New. L. F. Day. $3.00.
Costume Design and Home Planning. Izor. $1.00.
Elements of Perspective. Henry Lewis.
Free-hand Perspective Theory. Anson K. Cross. $1.25.
Introductory Course in Mechanical Drawing. J. C. Tracy. $1.80.
Interior Decoration. F. Alvah Parsons. $4.00.
Letters and Lettering. Frank C. Brown. $3.00.
Mechanical Drawing. Anson K. Cross. $1.50.
Modern Perspective. W. R. Ware. $4.50.
Model and Object Drawing in American Text-books of Art Education. Walter Smith.
Nature's Laws and the Making of Pictures. W. L. Wyllie. $6.00.
Perspective in American Text-books of Art Education. Walter Smith.
Perspective as Applied to Pictures. Rex Vicat Cole. $4.50.
Perspective Sketches from Working Drawings. F. E. Mathewson. $1.50.
Perspective for Art Students. R. G. Hatton. $3.00.
Photo Engraving Primer. Horgan. 75 cents.
Printing for School and Shop. F. S. Henry. $1.50.
Problems in Mechanical Drawing. C. A. Bennett. $1.00.
Writing, Illuminating and Lettering. Edward Johnston. $3.50.

Other books may be as helpful as those named, and the student need not feel restricted to this list.

The prices given are changing often, and some of the books are out of print and to be found only in libraries.

APPROVED BY PAINTERS, SCULPTORS, EDUCATORS.

Adams, Herbert, *Sculptor.*—"It is a most valuable aid for beginners."

Andrew, Richard, *Painter, Instructor Normal Art School.*—"Your Painting Lenses instantly correct vision and enable beginners to record true relative values."

Benson, Frank W., *Painter.*—"The Glass should be of great use to beginners and enable a pupil to advance with little instruction."

Booth, Etta E., *College of the Pacific, San José, Cal.*—"I find it a wonderful help and should hardly know how to do without it."

Bosley, Frederick, *Painter, Instructor Museum of Fine Arts, Boston.*—"After studying with you a short time your pupils show remarkable improvement. I approve of your methods."

Dallin, Cyrus E., *Sculptor, Instructor Normal Art School.*—"The results you have achieved are a most striking testimonial to the value of the Drawing Glass."

De Camp, Joseph, *Painter.*—"I have never seen in my long years of teaching such remarkable results as those you have obtained by use of the Drawing Glass."

Deem, Mary G., *State Normal School, Valley City, No. Dak.*—"I am as enthusiastic as ever. My students, who never drew before, are amazed at their own progress. It should sell as a part of every school equipment."

George, Vesper L., *Painter, Instructor Normal Art School.*—"The never-ending testimonies of your students, and many years of observation impel me to give with pleasure my unqualified approval of the clearness and efficiency of your methods."

Grafly, Charles, *Sculptor, Pennsylvania Academy of Fine Arts, Philadelphia, Pa.*—"Your teaching, in a way almost beyond belief, enables the beginner to gain a sure eye and touch. Your method in the study of drawing and painting is the most practical I have ever known. When those in charge of public, elementary, and art schools see the wisdom of such a course,—as they must when it is realized that the proper use of the Drawing and Painting Glass is not mechanical but merely a means to an end,—then the student will be better equipped to see, and, to see, after all, is one of the greatest things we are able to teach."

Hale, Philip L., *Painter, Instructor Museum of Fine Arts, Boston.*—"Your results from beginners are surprising. I am pleased to recommend the Glass."

Hamilton, Wilbur Dean, *Painter, Instructor Normal Art School.*—"Your results from the entering class are extraordinary."

Hazard, Arthur M., *Painter.*—"Your Painting Lenses are a most valuable aid in discerning color relations and values and your Drawing Glass teaches the principles of correct observation in the simplest manner."

Hibbard, Aldro T., *Painter.*—"The Glass is of infinite value to students and painters desiring speed and correct vision. We owe much to Mr. Cross for his interest and perseverance in the advancement of honest art education."

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Jones, H. Bolton, *Painter, New York.*—"The Glass commends itself to me for the ease with which **a student can compare his own work** with the object."

MacNeil, Hermon A., *Sculptor, New York.*—"I am convinced through trial that your Glasses are of great value in training the student to see and represent accurately. To me **its chief value is its striking effect on the mind of the pupil**, for it proves with his eyes and not with his teacher's, thus disarming doubt and insuring progress."

Major, Ernest L., *Painter, Instructor Normal Art School, Boston.*—"The artistic drawings your pupils make after use of the Glass **please me greatly.**"

Murphy, J. Francis, *Painter.*—"The Glass is **a splendid corrective** and fine for students. I congratulate you."

Norton, Georgie L., *Cleveland School of Art.*—"In time **all art schools will give your Glass a place** in the teaching of elementary drawing."

Nowell, Ethel K. S., *Tolethorpe School, Newport, R.I.*—"I am pleased to report that the Glasses in use have produced **their unconscious and definite effect on the most wildly unseeing eyes.**"

Patrick, Mary L., *Director of Art, Wellesley, Mass.*—"The Glasses have proved a **great help to thoughtful drawing and self-reliant work** by the pupils."

Paxton, William M., *Painter, Boston.*—"Your first-year students show understanding that the average student gets only after long experience. **It should be used in the public schools** as well as in art schools."

Peabody, Robert S., *Peabody & Stearns, Architects, Boston.*—"Teachers should welcome your Glass which substitutes absolute proof for their opinions and **is not a get-rich-quick method.**"

Randall, Asa G., *Commonwealth Art Colony, Boothbay Harbor, Me.*—"**It is the quickest way** to teach the appearance of objects that I have ever tried. Pupils get more interested when they learn to draw so rapidly."

Robinson, William S., *Painter, New York.*—"I heartily recommend **your Glass, which cannot fail** to be of the greatest assistance to both teacher and student in elementary art study."

Ross, Denman W., *Harvard University.*—"I have used your Drawing Glass in my classes and have urged other teachers to use it. **It should be used in the schools wherever free-hand drawing is taught.** It will be helpful to the teachers as well as the scholar."

Sargent, John S., *Painter.*—"Frequent use of the Glass will put one on guard against any habitual error."

Tarbell, Edmund C., *Painter, Instructor Corcoran Gallery, Washington, D.C.*—"The Glass is the best aid to drawing ever made. **I wish it could be adopted by every school in the land.**"

Taylor, W. L., *Painter, Wellesley.*—"I am glad to say your Glass is **a very good thing.** Please send me another for a child in whom I am interested."

Varney, Charles E., *Superintendent of Schools, Gray, Me.*—"One could not believe such results possible unless he saw the actual work both at the beginning of the term and now. **The Glass will be a missionary to rural sections."**

Vonnoh, Robert W., *Painter, New York.*—"The use of your Glass revolutionizes the matter of drawing to such an extent that **when the Glass is laid aside** nearly all the drawings in a class of over one hundred seem evenly correct. Every school and **every student would be benefited by its use."**

Walker, C. Howard, *Architect, Director School of Design, Boston.*—"The best aid to observation I have seen, being **direct, sensible, and simple.** The results from its use are remarkable."

Journal of Education.—"This is one of the **most important** and significant **revolutionary or evolutionary aids** to drawing. In its line it is as distinct a discovery as those which have made men famous in science. It develops an eye for perspective and **makes the artistically brainless, brainy** in the use of eye and hand."

School Arts Magazine.—"If you think you can draw an object correctly free-hand, this device will **'get the laugh on you'** before you draw your breath a second time. If you think you cannot draw, it will teach you how. Equip your students with the Glass if you want to see **astonishing results.**

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"Pupils who have done successfully a year's work in this class before entering the School may expect to be advanced more rapidly, and thus shorten their school course.

"For information apply to—Home Study Class, School of the Museum of Fine Arts, Boston, Mass."

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Painting Glass, Mailing Case, and Crayons (It is also a Drawing Glass)	2.50
Painting Lenses (adjustable in finder with spirit-level)	1.75
"Cross" Crayons . . . . . 12, 30 cts.; 36, 75 cts.; gross,	2.50
Drawing and Painting Self-taught	3.00
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